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JOSEPH TIEFFENTHALER AND HIS GEOGRAPHY OF HINDUSTAN

By S. N. Sen

In the seventeenth and the eighteenth centuries the Jesuit missionaries in India played an important role in the advancement of secular learning—in astronomy and geography, natural history, history and oriental studies. In the seventeenth century we hear of Father Antonio Ceschi, a learned mathematician, who was also interested in the Sanskritic studies. The Bavarian Father Henry Roth was one of the early Europeans to have introduced the Sanskrit characters to the notice of the literati of Europe. Fathers Johann Grueber and Albert d'Orville, belonging to the team of Jesuit astronomers working in China, travelled from Pekin to Agra *via* the difficult route through Lhasa and Nepal and determined the latitudes of a number of places in northern India, including Patna. In the coastal and peninsular India, a good many Jesuit missionaries, skilled in astronomy, were engaged throughout the seventeenth and the eighteenth centuries in determining the latitudes and occasionally the longitudes of places. Of them the most conspicuous were Fathers Bouchet, Mandeslo and Noël, whose valuable observations enabled D'Anville to prepare a reliable map of peninsular India. Father Claude Boudier of Chandernagore rendered signal service to the cause of Indian geography by his remarkably accurate latitude and longitude determinations. No less significant in the history of the eighteenth-century astronomy in India is the part played by the Jesuit astronomers, Fathers Figuerado, Gabelsperger, Strobl and others associated at one time or other with the astronomical observatories set up by Rājā Jai Singh Sāwai. To such a group of Jesuit astronomers, mathematicians and geographers belonged Father Joseph Tieffenthaler, probably the most remarkable of them all.

Joseph Tieffenthaler was born at Bolzano (also known as Botzen or Bozen) in the old Austrian Tyrol on 24th July, 1710.[1] Practically nothing is known about his early career except that he joined the Society of Jesus on 9th October, 1729, left Austria for Spain in 1740, where he spent two years in the service of the Society of Spain, and in 1743 sailed from Portugal for India, by way of the Philippines, to spend, as it came to pass, the rest of his life in the vast sub-continent.

It is certain that Father Tieffenthaler had a good education in the religious schools of Tyrol and, along with his ecclesiastical and humanistic studies, acquired sufficient proficiency, according to the standards of the day, in mathematics, astronomy, geography and natural sciences, with a good grounding in the languages. Before leaving the shores of Europe he had become a trained mathematician and astronomer, skilled in the use of astronomical and philosophical instruments, including the quadrant, the armillary astrolabe and the magnetic compass, for the determination of geographical latitudes and longitudes, for observing such astronomical phenomena as the eclipses, the transits of inferior planets, the sun-spots and the like and for keeping meteorological records concerning the variation of temperatures and wind. In biological sciences, although he wrote a treatise, reported to be lost, on the natural history of India, describing the

[1] Phillimore, I, 388. Maclagan (137) mentions the year of his birth as 1715.

flora and the fauna,[1] he does not appear from what can be gleaned from his extant *Geography*, to have either gone very far or kept touch with the progress that had been taking place in Europe in these sciences.[2]

His linguistic equipment on which the Jesuit Order had always laid great emphasis was extraordinary even by the standard of the said Order; for, besides German, his own tongue, he had a good knowledge of Latin, Italian, Spanish and French, to which he added, during his long stay in India, a good working knowledge of Persian, Arabic, Hindustani, Sanskrit and possibly other languages.[3] From the fact that he composed most of his writings in good Latin it is open to question whether he attained an equally good literary standard in other European languages besides his native German. The encyclopaedic work he undertook of composing an historical and geographical description of Hindustan, conceived on such a wide plan as to include the physical and natural features, resources and products of the vast sub-continent, the manners, customs, occupations, religious beliefs of a multitude of races inhabiting the land, and their arts, sculpture, monuments and buildings, called for a close familiarity with works of a diverse nature written in the languages of the country for which purpose Tieffenthaler 'n'avoit pas négligé de se familiariser avec les langues les plus usitées dans le pays, le Persan, le Maure ou Indoustan, & d'autres'.[4] Of all these languages he acquired the most perfect knowledge of the Persian in which he composed at least two treatises.[5] We have Tieffenthaler's own words that 'j'ai lu dans les livres Persans qui traitent de la Géographie & de l'Histoire de l'Inde'.[6] Regarding his Persian writings, he informs us that he utilized his leisure hours, during his stay in Narwar, in writing in Persian various tracts refuting the Mahomedan sect and a number of other booklets aimed at explaining the mysteries of Christianity and arousing piety in the reader.[7]

He was certainly not a Sanskrit scholar, but that he knew enough Sanskrit may be assumed from his reported compilation of a Sanskrit-Persian dictionary which, like many of his writings, had long since ceased to be extant.

It is not known definitely whether Tieffenthaler was sent to India as one of the many Jesuit missionaries for the general intention of furthering the interests and objects of the Society or whether he had originally been intended, as both Noti and Maclagan have supposed, for astronomical work in one of Rājā Jai Singh's observatories.[8] Jai Singh's interest in having European astronomers work in his famous observatory at his capital city and, more particularly, the arrival in 1740 in Jaipur of two Bavarian Jesuit missionaries, Fathers Gabelsperger and Strobl, arranged at the Rājā's request by the Society's headquarters in Rome,[9] make such an assumption very plausible indeed. Father Gabelsperger, it may further be noted, died the following year, in 1741. What we know more definitely is the death of Rājā Jai Singh Sāwai in 1743, the very year Tieffenthaler sailed from Portugal for India, and, with the passing of this great patron

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[1] Phillimore, I, 388; Sommervogel, S. J.: *Bibliothèque de la Société de Jésus*, Paris, 1932; Bernoulli, I, 6; II, 421–24.

[2] Bernoulli, Preface, X.

[3] Maclagan, 138. Noti, 146. Bernoulli, Preface, IX.

[4] Bernoulli, *loc. cit.*

[5] Noti, *loc. cit.*

[6] I, 3.

[7] I, 5.

[8] Noti, 146. Maclagan, 137.

[9] Maclagan, 134.

of science and learning, the end of a brief but brilliant interlude in observational astronomy of which we have few instances, if any, in India.

Whatever the original intention, any hope of being engaged solely in astronomical observations and research had been lost for good before Tieffenthaler set his foot on the soil of India. He was ordered by the Jesuit authorities of Goa to proceed to Agra to take up apostolic work in the famous Jesuit College there. Since the days of Akbar it had always remained the focal point of the Mission. His journey from Goa to Agra shortly after his arrival in 1743 marked the beginning of a life of restless travels and wanderings which took him through the greater part of India and of which he himself has left an account to be reviewed in what follows. His work at the Agra College was short, for in 1747, while still a young man—a 'wackerer und eiffervoller Missionarius'—he was appointed as a priest to the Bourbon Colony at Narwar, and carried on the duties of his assignment till 1765, a period of about eighteen years, undertaking frequent travels, making observations and measurements, taking copious notes of whatever he observed, and thus continuously collecting materials for his proposed *Descriptio*.

Tieffenthaler's activities fell during the declining phase of the Jesuit Mission. By a decree of July, 1759, from King Joseph of Portugal, the Mission was closed from all Portuguese territories and all Jesuit missionaries of Portuguese and other nationalities were packed home as prisoners and subjected to many atrocities.[1] Although Tieffenthaler was fortunate to escape such an ordeal, he felt the pinch before long. This was further aggravated by the death of the Armenian Governor of Narwar. By 1765 his congregation dwindled to such an extent and had reached such financial straits that he had no alternative other than to abandon Narwar in search of work and subsistence elsewhere. Overnight he became, as it were, 'a pastor without a flock; worse yet, he was a penniless man, without even the necessaries of life'.[2] In such distressing circumstances he thought of approaching the authorities of the English Company in Bengal for financial assistance and journeyed to Calcutta by taking the land route through Datia, Jhansi, Mahoba, Kalinjar, Allahabad, Lucknow, Fyzabad, Jaunpur, Banaras and the river route down the Ganges, visiting such places as Patna, Monghyr, Rajmahal, Murshidabad, Hughli, Chandernagore. Bernoulli's translation of Tieffenthaler's description, inserted in the author's preface, of his own plight on the eve of his quitting Narwar is reproduced below:

'Mais vers le commencement de 1765, me trouvant embarrassé pour ma subsistance, je fus obligé de quitter *Narvar*, & je pris la resolution de me transporter dans le *Bengale*, persuadé que l'illustre nation Angloise, qui se distingue par son humanité, par sa liberalité, & par sa charité envers les indigens, ne me laisseroit pas sans secours.'[3]

The much-needed financial assistance Tieffenthaler must have got without difficulty, for in the month of October of the same year we find him leisurely proceeding up the Ganges, with compass and possibly other instruments in hand, following the meandering course of the great river, carefully tracing the same on paper as well as the mouths of the various tributaries falling into it and marking down the places on either side of the river. This ushered in a new phase of his activity, namely a thorough exploration of the course of the Ganges and of the hitherto little-known Gogra basin. For five years, beginning 1766, he travelled all over the

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[1] Noti, 275.
[2] Noti, 276.
[3] I, 5.

province of Oudh, with Lucknow as his headquarters, visiting innumerable places and exploring the principal rivers and their tributaries flowing through this province. A detailed description of his observations is recorded in his geography of the province of Oudh[1] and in the paper, 'La Description du cours du Gange & du Gagra, avec une très grande carte', which the learned French orientalist, M. Anquetil du Perron, first published on the basis of Tieffenthaler's manuscript and drawings in the *Journal des Sçavans* in December, 1776. Later on, the paper was enlarged and incorporated in the second volume, part two, of Bernoulli's *Description.* The appearance of Anquetil's paper and maps immediately established the Gogra as a major river extending over a length of 500 *cosses* and having no less than 29 affluents and Father Tieffenthaler as a pioneering geographer among the European savants of the time.

Little information is available of Tieffenthaler's activities from 1771 or 1772, by which time he had finished his survey of the rivers of Oudh, till his death in 1785. On finishing his Oudh survey he in all probability settled down to arrange and give final shape to his manuscripts and drawings which must have by this time grown to voluminous proportions. The suppression of the Jesuit Mission left him with no hope of publishing his materials through ecclesiastical channels; the only course open to him, therefore, was to interest some influential scholars in Europe in his endeavours in order that his works might see the light of day or might at least escape destruction. As early as 1759, while still in Narwar, he had picked up by correspondence the acquaintance of Anquetil du Perron, the weird pioneer of oriental scholarship, during the latter's stay in Surat. To Anquetil, who had meanwhile settled in Paris as a member of l'Académie Royale des Inscriptions & Belles-Lettres and interpreter to the King for Oriental Languages, he sent from Fyzabad in 1776 his three large maps, representing the entire course of the Ganges and the upper and the lower courses of the Gogra and 21 detached drawings of the confluents of the various tributaries of these two rivers.[2] His geographical and other manuscripts, all written in Latin, were sent to Dr. Kratzenstein, a renowned professor of medicine and physic in Copenhagen, through a mutual friend, Mr. Flohr, a medical practitioner in the Danish colonies, whom Tieffenthaler had intimately known.[3]

Tieffenthaler must have felt quite happy in being thus able to send his maps, manuscripts and drawings to safe hands in Europe. In the Preface of his *Geography*, he writes:

'I have despatched to Europe, with my *Description of India*, the drawings of a large number of cities, castles and fortresses in order that those who had not visited these countries may, while looking at these drawings, see these multitudes of cities and fortresses as if in a mirror and in spite of their immense distances have them, so to speak, before their eyes.'[4]

We hear of his stay in Agra in 1778 when he was already old and in failing health, 'vecchio cadente'.[5] It appears that he was in Agra up to 1781, in which year he handed over the Agra Mission to the Carmelites and transferred his quarters to Lucknow.[6] In 1784, Col. F. Wilford, the learned orientalist, met the old Father at Lucknow one year before his

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[1] I, 250–307.

[2] Bernoulli, Preface, I, X; II, 266. Noti, 410.

[3] *Ibid.*, Mr. Flohr had died in Patna a few years before Bernoulli undertook to edit, translate and publish Tieffenthaler's *Geography*.

[4] I, 7.

[5] *J.A.S.B.*, VI, 537, 1910.

[6] Maclagan, 137.

death and several years later referred to his visit as follows: 'I saw the good old man at *Lucknow*, in the year 1784. He was a man of austere manners, and incapable of deceit.'[1] There is hardly any doubt that Wilford made good use of his acquaintance and meeting with Tieffenthaler, to whose geographical and historical descriptions he frequently referred. He obtained from the old Father extracts from Otter's works which Tieffenthaler had procured from Europe. These circumstances have been utilized by Father Hosten in suggesting that Tieffenthaler probably had in his possession the original manuscript, supposed to be lost for over three hundred years, of Father Monserrate's *Mongolicae Legationis Commentarius*, if not the whole MS. at least his Book II dealing with the geography and natural history of India *intrà Gangem*, the customs of the ancient aborigines and the present-day natives, and that Wilford who made use of much of Monserrate's geographical materials obtained the MS. from the old man at Lucknow.[2]

Tieffenthaler died in 1785 at Lucknow, but his body was interred at the Padri Tolla Cemetery at Agra.[3]

Tieffenthaler's Travels in India

In the Preface to his *Descriptio Indiae*, Tieffenthaler recorded, *inter alia*, a brief but valuable diary of his travels in India, in the course of which he covered a large number of districts and visited innumerable cities, principalities and villages, large and small.[4] Some dates and details of his astronomical and other observations may also be gleaned from the mass of information given in the *Description*. His itineraries in India during 1743–1770 are shown in a map prepared for this purpose.

In the month of December, 1743, he arrived by boat at the Portuguese colony of Daman, and from there went by sea to Surat, a very famous commercial city. Here he spent some time in making astronomical observations, such as the determination of the latitude and longitude of Surat, and correcting its longitude by observing the occultation of Jupiter by the moon on 2nd February, 1744.[5] Possibly he went to Daman from Salsette, where we find him busy in finding the latitude by the sun's meridian altitude and observing on 4th November, 1743, the Transit of Mercury across the sun's disc 'comme un charbon ardent'.[6] Unfortunately, Tieffenthaler was unable to take advantage of the phenomenon for any useful astronomical purpose, due to his failure to observe, in the absence of proper instruments, the ingress and egress of the transit.

In March, 1744, he returned to Daman, observing on the way the comet, and stayed here till the end of September. He observed a lunar eclipse on 26th April and calculated the difference of longitudes between Paris and Daman to be 4 hr. 20 min.[7] The same year he went back to Surat and from there travelled by road to Broach, Baroda, Godhra, Lunavada, Sagwara, Udaipur, up to the newly-built and magnificent city of Jaipur, also known as Jainagar. At Broach he observed the declination or variation of the

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1 *Asiatick Researches*, IX, 212, 1807.

2 Hosten, 527–28.

3 Blunt, 51–52.

4 I, 3–7.

5 I, 404.

6 I, 501. Bernoulli corrects the date of the Transit of Mercury to 4th November; the month is not mentioned in the text through oversight and the date is put wrongly as 5.

7 I, 407.

magnetic compass as 3° 30′[1] on 2nd November, 1744, and measured the latitude of the place about the same time.[2] By 23rd November he was in Udaipur, where he determined its latitude as 25°.

From Jaipur, he took the route leading towards east and visited Dig, the royal residential city of the prince of the Jats. From there he arrived at Agra, either towards the end of 1744 or at the beginning of the following year; for on 2nd and 3rd May we find him occupied with latitude determination of the city.[3] For the next few years the Jesuit College of Agra was to be the place of his work. On 7th March, 1746, he used an eclipse of the moon for determining the longitude of Agra. From Agra he made frequent excursions in 1745 to Muttra, Brindaban and other neighbouring places sacred to the Hindus, particularly to those believing in the Kṛṣṇa cult, and collected information about the Kṛṣṇa legend and the religious beliefs and practices of the Vaiṣṇavas and the Vairāgīs. In Muttra he did not fail to visit Jai Singh's astronomical observatory on the summit of a hill.

In May, 1747, he visited Delhi, 'capitale actuelle de l'Inde' and the residence of the Mogol Emperors. On 16th and 17th May he determined the latitude of the capital with an astrolabe.[4] His stay in Delhi was brief, for in July of the same year he proceeded to Narwar to join his apostolic duties to the Christian community there. Narwar, Tieffenthaler informs us, was then under the governorship of a Christian of Armenian descent, who served under a Hindu Rājā and at the same time commanded honours and favours from the Mogol Emperor.[5] He built a chapel for his Christian community which was apparently in a flourishing state and Father Tieffenthaler's duty it was to minister to their spiritual needs. For the next 18 years this picturesque city on the summit of a mountain in Central India remained the place of his evangelistic and literary activities—a centre from where he planned and executed several travels.

In 1750 he set out on a journey to Goa. Following a southernly route, he at first went over a number of places in the province of Malwa, and visited important cities such as Sironj, Sarangpur and Ujjain. He observed the latitude of Sarangpur on 3rd March and that of Ujjain on 6th March, 1750.[6] At Ujjain he visited the astronomical observatory built by late Rājā Jai Singh Sāwai of which he has given a description in his *Geography*.[7] Proceeding further south he crossed the river Narbada, penetrated with difficulty into the district of Newar, and reached the city of Burhanpur (*Brahmpour* or *Borhanpour*), the capital and seat of government of the province of Chandess. Thereafter he moved through the territory of Concon and proceeded to Goa by way of Thana, Bombay and Sifardan halting, among other places, at Nasik and Kalyan for determining the latitudes of these two places on 1st and 6th April respectively. He arrived in Goa on 20th April and stayed there for six months.

His return trip to Narwar was through the province of Gujarat and Ajmer. Towards the end of October, 1750, he left Goa for Surat, from where he took the route through Broach, Cambay, Gujarat (modern Ahmadabad) and Radhanpur. This was his second visit to Broach. Although he does not mention Baroda after Broach in his Preface in this

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[1] Noti insufficiently interprets 'la déclinaison de la boussole' as 'the dip of the magnetic needle', 149.
[2] I, 391.
[3] I, 165.
[4] I, 125.
[5] I, 175–76.
[6] I, 351, 347.
[7] I, 347.

particular journey, he appears to have passed through this city for the second time, for he determined the latitude of Baroda on 10th January, 1751.[1] In Cambay, he measured the latitude of the place on 14th January, 1751,[2] and one week later that of Ahmadabad.[3] He arrived at Radhanpur in the month of February and observed the latitude of the city. From there he travelled through the province of Marwar and visited among others Jalor, Jodhpur and Merta. It may be noted that in this journey from Gujarat to Jalor, Tieffenthaler took the longer route through Cari, Sami, Radhanpur, Babhar, Tharad, Sanchor and Bhinmal, a large part of which passes over arid tracts, instead of following the shorter route through Mehsana, Palanpur and Bhinmal.[4] He was in Jalor on 1st March and determined on this date its latitude and in Jodhpur on 6th March, whose latitude was likewise observed. From Merta, he entered the province of Ajmer and reached the city around 14th March on which date he observed and determined the latitude of the place.[5] He also calculated Ajmer's longitude from route mileage, but was not satisfied with the result and stressed the need for further examination by the more dependable astronomical methods. He visited the famous Salt Lake of Sambhar near Ajmer and left a valuable account of the manufacture of salt from its saline waters and its importance in the State's economy.[6] At Sambhar he measured the latitude with the help of an astronomical quadrant made of copper and also calculated its longitude.

From Ajmer he visited Jaipur for the second time and from there proceeded to see the famous fortress of Ranthambhor. On the last lap of his journey from Ranthambhor to Narwar, he crossed the Chambal and took the route towards the south-east through *Sopor* or *Sopour*, modern Sheopur, *Carail* (or *Carael*) and *Porim* (or *Pori*), modern Pauri, arriving at Narwar in the month of April, 1751.

He did not stay long at Narwar and was again out after a few months on a tour which took him through Gwalior, Gohad, Atter, and Bhind to Agra. Towards the end of November of the same year he returned to Narwar from Agra by way of Sikandra, Fatehpur, Bayana, Karauli, Mandrael, Bijaipur and *Gopalpur*.

During the next twelve years Tieffenthaler passed most of his time in Narwar. Nevertheless he undertook three or four journeys to Agra and Delhi for visiting in particular Father André Strobl, who had come to India from Germany at the invitation of Rājā Jai Singh, curious astronomer, accompanied by another missionary (Father Gabelsperger, d. 1741) to work in his Jaipur observatory. He also made other exploratory excursions to nearby places, as is evident from his observations of the latitudes of Kotta and Sheopur on 8th and 31st March, 1759, respectively.[7] Some of his Persian works refuting Islam and a number of small tracts propounding the mysteries of Christianity were written in his leisure time during this period.

From towards the beginning of 1765, following the suppression of the Jesuit mission, the death of Narwar's Armenian Governor and the decline of its Christian community, Father Tieffenthaler was again on the move at first in search of financial assistance and patronage from the English East India Company in Bengal and thereafter in quest of exploration of

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[1] I, 394.
[2] I, 381.
[3] I, 376.
[4] I, 332–33.
[5] I, 311.
[6] I, 312–13.
[7] I, 322, 324.

the river basins of the Ganges and the Gogra in the province of Oudh. Leaving Narwar he took the route through Datia, Jhansi and Urcha, observing the latitude of Datia on 2nd February, 1765,[1] and entered the district of Dangaya in Bundelkhand. He visited Mahoba (*Mahobba*), Kalinjar, Chitrakut, a sacred place of the Hindus, Chhatarpur, Jirna, Parna, noted for its diamond mines, and Ajaigarh, and arrived at *Thoroa*. The dates of his visits to some of these places can be ascertained from his records of observing latitudes, e.g. Mohoba in February; Rassein, a big village, seven miles north-east of Kalinjar, on 1st March; Thoroa on 3rd March, 1765.[2] After Thoroa he crossed the Jamna and arrived at Allahabad.

About the beginning of April, he left Allahabad for Lucknow where he determined its latitude on 7th April.[3] After Lucknow, he visited Bangla or Fyzabad, Jaunpur and Banaras, where he took to the river route down the Ganges by boat, visiting successively Patna, Monghyr, Rajmahal, Murshidabad, Cassembazar, Hughli, Chandernagore and finally Calcutta. In this part of the country, Tieffenthaler did not waste time over latitude determinations in view of excellent values already obtained by Father Boudier of Chandernagore,[4] a very skilled and competent astronomer, and accepted and utilized by all geographers from d'Anville to Rennell.

From Calcutta he returned to Allahabad in a small boat about the end of October, 1765. In his journeys down and up the Ganges, as has already been said, he carefully observed with a compass the course of the Ganges, sketched the manifold windings and the junction of rivers discharging into the Ganges as well as jotted down a large number of places situated on either side of the river bank. In his own words (Bernoulli's translation): 'Vers la fin d'October de la même année, je me mis dans un petit bâteau, & retournai à Elahbad. En allant & en revenant j'ai observé & suivi avec la boussole le cours du *Gange*, le plus grand des fleuves de l'Inde; j'ai tracé sur le papier ses differens detours; j'ai marqué les endroits situés sur l'un & l'autre bord, & j'ai dessiné l'embouchure, des rivieres qui se jettent dans le *Gange*.'

In February, 1766, he left the Company's camp at Corra and returned to Allahabad at the end of April. On 3rd February before leaving for Corra, he had carried out a latitude determination of Allahabad and obtained the value of 25° 9′ as against 25° 25′ by Claude Boudier.[5]

From Allahabad he moved to Lucknow and, making this city his headquarters, travelled over a period of five years throughout the length and breadth of the province of Oudh, visiting a large number of cities and villages which he meticulously described or just referred to, with a few details of their geographical location in his *Geography*. His geography of the province of Oudh makes tedious reading on account of what appears to be unnecessary and avoidable details of unimportant places. In this he indulged purposely, it appears, with a view to describing accurately the passages, endless windings and curves of a large number of rivers and rivulets flowing through this province—five large rivers, the Gogra, the Sarju, the Gumti, the Chauka and the Rapti, and about seventeen smaller ones noticed by Tieffenthaler himself.[6] In fact, the main object of his

[1] I, 183.

[2] I, 244, 247, 248.

[3] I, 257.

[4] Father Claude Boudier (b. 16-10-1686 in France and d. 1757 in Chandernagore) arrived in Bengal about 1718–19, established himself at the French colony of Chandernagore as a skilled astronomer and visited the Jaipur observatory at Rājā Jai Singh's invitation in 1734.

[5] I, 227.

[6] I, 251.

travels in Oudh was to explore the courses of these various rivers from their mouths up to their sources in the northern mountains, for which purpose, as he himself informs us, he not only moved about from place to place himself, but equipped a person trained in geography with a compass and sent him to the Camaun mountains up to the cataract of the Gogra, one of the largest rivers judged by the volume of waters it discharges, and even up to *Pethana* and the defiles of Deucara, in order to measure the distance of the places and determine from them their relative positions.

'Non seulement je parcourus en personne ces differentes contrées; mais j'ai encore muni d'une boussole un homme versé dans la géographie & je l'ai envoyé jusque sur les monts de *Camaoun* & aux cataractes du *Gagra*, un des fleuves le plus considerables par le volume de ses eaux; jusqu'à *Pethana* & aux défilés de *Deucara* (*Saltus Deucaranos*) pour measurer les distances des lieux & en determiner les situations respectives.'[1]

In addition to his riverine exploration, Tieffenthaler did not neglect to ascertain with an astronomical quadrant the latitudes of several places in this province, previously inadequately served, if at all, by such determinations. These places include Lucknow (7th April, 1765),[2] Gorakhpur (11th March, 1770),[3] Bahraich (Beraiz),[4] Khairabad (*Cherabad*),[5] Balrampur (4th March, 1770),[6] *Pethana*,[7] *Nanamao*,[8] *Mouhammadi* (11th April, 1769),[9] *Poulhar* (lake),[10] *Cacrela* (6th December, 1767)[11] and *Dorania* (12th December, 1767).[12] At Balrampur and Nanamao, he was unsuccessful with his quadrant, due to clouds covering the sky, but calculated the latitudes on the basis of route mileage. The latitude of *Pethana*, 53 miles north of Balrampur, from which one mile was rejected to account for detours of the route over mountainous tracts, was determined solely from considerations of route mileage.

The object of such great care and trouble as he took throughout his travels in India in determining the latitudes of places was to be able to prepare without difficulty, whenever he wanted to, a geographical map of India—'afin que si jamais je voulois dresser une carte géographique de l'Inde, ce travail difficile me devint plus aisé'. It is doubtful and indeed a matter of great disappointment if Tieffenthaler could ever settle down to carry out his cherished desire of producing a map of India, which, apart from being an important contribution to Indian cartography, would have immensely facilitated the study of his *Descriptio Indiae*. Bernoulli had to make good this deficiency as well as possible with the help of Rennell's map of Hindoostan.

TIEFFENTHALER'S WORKS

Tieffenthaler's *magnum opus* is without doubt his *Descriptio Indiae*, the original title given by the author himself to his work in Latin, which

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1 I, 6.
2 I, 257.
3 I, 259.
4 I, 259.
5 I, 261.
6 I, 262.
7 I, 264.
8 I, 271.
9 I, 280.
10 I, 281.
11 I, 289.
12 I, 289. Rennell criticized Tieffenthaler for not measuring the latitudes of a still larger number of places, particularly those near and at the source of the Gogra, and for not visiting the source himself (*Memoir*, 308).

Bernoulli in his French version renamed, not without justification,[1] *La Géographie de l'Indoustan.* A general title such as 'Description of India' implies much more than the author envisaged. True it is, Tieffenthaler, in his encyclopaedic efforts to give as full a description of India as possible, touched practically on all possible subjects such as chronology, religion, history, manners and customs, revenues, natural history, natural products and mineral resources, art, architecture, monuments, buildings, town planning, etc., and gave for provinces, sometimes even for districts and cantons, long and interesting lists of their past rulers. But the central purpose, as is abundantly manifest throughout the work, was to give a geographical description of the country. Tieffenthaler himself was not unaware of this, as otherwise what could be the reason of his writing separate and more comprehensive treatises on other subjects, such as the Natural History of India, the Religion of the Brahmins? As to the word 'l'Indoustan', the scope of his geography did not include the whole of India but was limited to the territory over which the Mogol power at its highest extended but which never comprised the whole of India. This territory was generally known by the name of 'Hindustan', in the Persian works in particular, to which Tieffenthaler has himself called attention: 'Les Persans disent *Hindoustan*, et cette denomination n'est pas ignorée de ceux qui possédent les langues Indienne, Persane et Arabe.'[2] For the same reason, Bernoulli objects to Rennell's calling his work *Memoir of a Map of Hindoostan* as it covered the whole of India and has preferred to entitle his translation of the *Memoir* (Volume III) as *La Carte générale de l'Inde, etc.*

Viewed in the background of the eighteenth century interest in historical and geographical researches concerning South and South-East Asia and India in particular, and of Tieffenthaler's own training and proficiency in astronomy, sciences, history and languages, it is not unlikely that he had conceived of such a project before leaving Europe. Significantly enough from the moment of his setting foot in India, he busied himself in the collection of materials either by proper observations, or by studies or through information from knowledgeable persons, for a complete and detailed description and a good geographical map of India—a task which absorbed all his time and energies outside his normal apostolic duties, for a span of thirty years.[3] 'Much has been written and many scholarly works have appeared on India, her grandeur, her religion and on the manners and customs of her inhabitants.' Writes Tieffenthaler: 'Nevertheless this very vast country offers yet an abundance of materials to write. It is precisely what I have been busy in assembling in this volume—such things as I have observed with my own eyes during a span of thirty years, things I have read in Persian books treating of the geography and the history of India and what I have learned in the course of conversation with persons informed in these matters. In Europe, one greedily awaits the precious merchandise from India; in sending this treatise I flatter myself to believe that it will be received with the same eagerness by the curious who will appreciate my work.'

Such sustained labours produced not just one but several works, maps and drawings. Reference has already been made to the three extraordinarily large maps on the course of the Ganges and the Gogra, 21 detached drawings of confluents of the various tributaries and related explanatory materials, put to good use by Anquetil and preserved for posterity by that

[1] Bernoulli, Preface, XIII–XIV.
[2] I, 30.
[3] Bernoulli, Preface, X; I, 3.

learned orientalist. As to his other writings, all in Latin, and sketches of which no trace could be made shortly after their arrival in Europe and by the time Bernoulli got interested in his works, we have only Tieffenthaler's own statements, notices of Anquetil and Bernoulli and Sommervogel's recent bibliography.[1] These include:

(1) A treatise on the *Religion of the Brahmins*, their ceremonies and manners and the much-vaunted wisdom of their philosophers ; this work contains such things as deserve to be reported, taken from Indian works, to which were added as illustrations drawings of idols, temples and other objects.

(2) *A Natural History of India* dealing with animals, birds, trees, plants and flowers, with a pencil sketch in each case.

(3) A book containing remarks and observations on the variations of the air and such other natural phenomena as the eclipses, the sun-spots, and the zodiacal light.

(4) A catalogue of places of which geographical latitudes were observed.

(5) A paper entitled 'De Longitude et Latitudine Indiae'.

(6) Indian astronomy and astrology.

(7) The course of the Ganges, together with a description of the villages and cities lying on both banks.

(8) The course of the Ganges from Priaga or Chlabado (Allahabad) to Calcutta, explored with the aid of a magnetic needle.

(9) The course of the Jamna, which is numbered among the great rivers.

(10) Geographical maps showing various coasts of India.

To these Sommervogel also adds his drawings of cities and forts, temples, idols and mountains which appear to form part of his *Geography* and his *Religion of the Brahmins*. Some of the drawings attached to his *Geography* are reproduced in Plates I–IV. Phillimore has located among Orme MSS. a letter Tieffenthaler wrote to General Richard Smith and a review of D'Anville's maps with the remark: 'Pour connoitre le Latitude et Longitude, la grandeur des villes considerables de l'Inde, leur situations, et autres choses rémarquables de cette vaste Empire, on consultera la description latin faite par le P.J.T.S. (Orme MSS. 23 (51)). Thomas Call received some of his papers, probably through Wilford.

Of these the first two, e.g. the *Religion of the Brahmins* and the *Natural History of India*, were among his major works. But as far as their merit can be guessed from occasional observations and statements concerning these subjects, incorporated in his *Geography*, their loss, Bernoulli was inclined to think, did not appear regrettable. Abraham Roger and Messrs. Dow and Hollwell had already done much useful work on the former subject,[2] and although the scope of further work was by no means exhausted, there were enough materials for the purpose available to a scholar in Europe at that time. Moreover, Tieffenthaler was handicapped by his inadequacy in Sanskrit to make much use of original Indian sources. But a more serious factor was his incapacity as a missionary charged with the duty of spreading Christianity among the idolators to approach the subject of Hindu religion and philosophy with sympathy and understanding and above all with a scholarly and scientific detachment such as generally

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[1] Bernoulli, Preface, IX; I, 6–7; II, 421–24; Sommervogel, *Bibliothèque de la Société de Jésus*, Paris, 1932; Phillimore, I, 388.

[2] Roger, Abraham, *Vies & Moeurs des Bramines*.

characterizes his astronomical and geographical studies. He spoke contemptuously of the manners and customs of the *Vairāgīs* (*Beragiens & de Beragiennes*), a Vaiṣṇava sect, he observed at Muttra and found nothing but superstition and obscenity in the cult of Kṛṣṇa and Rādhā whom he described as the former's concubine.[1] Likewise, the good missionary was always repelled at the sight of the image of Mahādeva (*Mahadeo*) for which his appellations were sometimes 'la figure obscene de *Mahadeo*'[2] at others 'l'infame figure de *Mahadeo*'.[3] Some of his Persian tracts, as already noticed, were directed against Islam and a number of others written to glorify Christianity.

Bernoulli suspected that Tieffenthaler's *Natural History*, even if found, would have hardly satisfied the connoisseur. Granting that he had picked up enough knowledge in these sciences as a Jesuit from Tyrol would most probably have done, he became fast out-of-date, particularly in view of new and radical developments in the system of classification and nomenclature at the hands of such eminent naturalists as Bauhin, Tournefort and Carl von Linné. This is evident from a few notices relating to natural history, botany in particular, contained in his *Geography*, which are not only poor and weak in their descriptions but use outmoded designations of plants from which it is difficult to guess their synonyms according to the new nomenclature then widely in use in Europe, or to ascertain whether he was referring to an unknown plant. It is also doubtful if the sketches he says he attached to his *Natural History* would have added much, as these were probably drawn, like those of his *Geography*, by a non-professional artist unskilled in biological drawings. In marked contrast to Tieffenthaler's efforts, foundations of the science of natural history in India were being laid throughout the eighteenth century by a set of professional men well grounded in the new system, such as Petrus Artedi, Henry Ruysch, Mark Eliezer Bloch and others in Europe[4] and Rheed (*Hortus malabaricus*), the Tranquebar missionaries J. G. Koenig, K. G. Klein, Benjamin Heyne and others, Patrick Russell, William Roxburgh and James Anderson, all working principally in the coastal areas of peninsular India.[5]

The same cannot be said of his astronomical and geographical tracts, and their discovery if ever should merit closer attention.

Bernoulli's Contribution

The importance of Tieffenthaler's *Geography*, apart from other considerations, may be judged from the fact that it found an editor and translator from the original Latin into two major European languages in no less a person than Jean Bernoulli, a distinguished mathematician, Astronomer Royal and ordinary member of the Academy of Sciences and Belles-Lettres at Berlin, and associated with all the major scientific academies and societies in Europe at the time, such as those of St. Petersburg, Stockholm, Uppsala, Copenhagen, Lyon, Bologne, and several others. Bernoulli first came to know of Tieffenthaler's works from Anquetil du Perron's paper 'La Description du cours du Gange & du Gagra, etc.' in the *Journal des Sçavans*, Paris, December, 1776 (Ed. of Holl, January, 1777) and further that his geographical manuscripts were lying somewhere in Denmark. He started making

[1] I, 204.
[2] I, 224.
[3] I, 335.
[4] Chaudhuri: 'On the History of the Study of Ichthyology'.
[5] Larwood, 62–76.

enquiries and soon succeeded in locating them—he does not say how—with M. Kratzenstein to whom Tieffenthaler had sent his manuscripts. In fact, Anquetil's intention in drawing the attention of scholars to this work was to secure its publication. Bernoulli now reinforced his efforts by publishing notices in the *Nouvelles littéraires*, Books II and III, as well as by other means. In Copenhagen Kratzenstein had also tried to find an editor but without success, because it was impossible to find one there for a Latin manuscript, full of foreign words, defective in composition at places and accompanied by a large number of badly-executed drawings in most part of such disproportionately large size as rendered their use impracticable without reduction. Moreover, no one would wish to undertake the task without first looking at the manuscript, and Kratzenstein would not run the risk of parting with it. In the circumstances Bernoulli decided to take up the work himself under the condition given by the author and save from menacing oblivion a work he believed curious and important.[1] The manuscript passed into his possession on 9th October, 1781.

Consultation with, and advice of, Anquetil became urgently necessary, for the French scholar had received the maps and explanatory notes closely bearing on the subject of the manuscript in question. Anquetil responded with rare warmth and generosity to Bernoulli's ideas and plans. The maps were then no longer in his possession as he had shortly after his work deposited them with the Map Section of the Department of Foreign Affairs (Dépôt des Cartes du Département des affaires étrangeres) in Paris. He interested the Count of Vergennes, Chief of the Department and great lover of science and learning in Bernoulli's project, obtained the maps forming an atlas of 30 leaves of exceptionally large format and took full responsibility of reducing them himself and having them engraved by a competent engraver before his very eyes and at his own expense. All this trouble he took, first to avoid exposing the precious originals to the accidents of transport and inevitable degradation at the hands of artists, and secondly because of the impossibility of entrusting to a distant artist the work of engraving a set of drawings complicated by multiplicity of objects, foreign characters and imperceptible strokes. Moreover, to explain the maps, Anquetil prepared for Bernoulli a new memoir much more extended than what had appeared in the *Journal des Sçavans*. All this, to say the least, is a splendid instance of co-operation between scholars with a common interest, namely the advancement of knowledge of a land and people imperfectly known, in a century otherwise torn with strife, jealousy and rivalry, territorial conquests and enslavement of people all over the world.

Bernoulli's original intention was to produce the work in two volumes: the first to contain a translation of Tieffenthaler's *Geography*, and the second Anquetil's memoirs referred to above and additions and notes made from Rennell's *Memoir*[2] and other works. Incorporation of a map indispensable for following the book with ease was dictated first by the author's failure to supply one himself and, second, by the recent appearance of Rennell's *Memoir* which received wide attention and appreciation. Matter remained at this stage when he first went to the press. But delay in

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[1] I, Preface, XI.

[2] Rennell, James: *Memoir of a Map of Hindoostan; or the Mogul Empire with an Introduction, illustrative of the geography and present division of that country* and a map of the countries situated between the heads of the Indian rivers, and the Caspian Sea; with an appendix containing an account of the Ganges and Burrampootar rivers (added in the 2nd edition). First map of two sheets—1st edition, 1783; 2nd edition, 1785. Second map of four sheets—1st edition, 1788; 2nd edition, 1791, and 3rd edition, 1793.

printing and appearance in the meantime of further researches of Anquetil on the history and geography of India led Bernoulli to alter his plans; to leave undisturbed the first volume containing his translation of Tieffenthaler's *Geography of Hindustan*, to devote the second volume entirely to Anquetil's writings in two parts: Part I, *Des Recherches historiques & chronologiques sur l'Inde* and Part II *La Description du Cours du Gange & du Gagra, avec une très grande Carte*, and add a third volume containing translation in its entirety of Rennell's *Memoir* with appendices, and a map of navigation in the interior of Bengal, extracted from his *Bengal-Atlas*.

In this way Bernoulli filled up the gaps existing in Tieffenthaler's *Geography*. Anquetil's dissertation constituting Part I of the second volume supplied nearly entirely what Tieffenthaler had omitted on the history and the rulers of the peninsula; Rennell's *Memoir*, Part I, third volume, threw a flood of light on the geography of the entire country; to these add Bernoulli's own copious notes and the scholarship he brought to bear on the work. Collectively the three volumes to which he appropriately gave the general title *Description historique & géographique de l'Inde*[1] thus emerged as an entirely new work, far surpassing the one he undertook to edit and translate. The German edition appeared in Berlin under the title of *Das Pater Joseph Tieffenthalers . . . historisch-geographische Beschreibung von Hindustan* between the years 1785 and 1787 and the French edition also in Berlin under the title mentioned above between the years 1786 and 1789.

The Geography of Hindustan

Tieffenthaler's *Geography* is divided into two broad sections: (*a*) Dissertation and Preliminary Researches, and (*b*) Geographical Description of the Provinces of Hindustan.

Under (*a*) he discussed in 14 separate chapters the following matters: (1) the extension of India (9–11); (2) the longitude and the latitude of India, after the Indian geographers (*corographes*) (12–18); (3) longitude and latitude of India, with distances between places, as given in the Persian work entitled *Ayn Akbari* or *The Method of Akbar* (18–23); (4) the Indian miles (or *cosses*) (23–25); (5) the inequality of Indian miles (25–28); (6) area of India in square measures (28–29); (7) the name of India (29–30); (8) references to India in the religious books (31–38); (9) the origin of the Indians (38–40); (10) the survival of Christianity in India since the arrival of the Portuguese (40–43); (11) ancient India (43–60)[2]; (12) the mountains of India (60–62); (13) division of Hindustan in Provinces (62–64); and (14) the revenues of Hindustan (64–66).

Under (*b*) Tieffenthaler adhered to the division of India into the following twenty-three provinces as existed in the times of the Mogol Empire: *Kaboul* (67–74), *Kandahar* (74–76), *Cachemire* (76–100), *Lahor* (100–114), *Moultan* (115–120), *Tatta* (120–124), *Dehli* (124–159), *Agra* (159–220), *Elahbad* (220–250), *Oude* (or *Avad*) (250–307), *Adjmer* (307–342), *Malva* (342–358), *Barar* (358–363), *Chandess* (364–370), *Guzarate* (370–415), *Behar* (415–437), *Bengale* (437–460), *Oressa* (460–476), *Aurengabad* (476–489), *Bhalagate* (or *Ahmadnagar*) (489–492), *Bedor* (or *Safarabad*) (492–494), *Hederabad* (or *Golconde*) (494–496) and *Bedjapur* (496–516), with digressions

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[1] Bernoulli, Preface, XIV.
[2] Pages '58' and '59' are misprinted as '38' and '39'.

on the countries of *Caschgar* and *Tibet.*[1] The description for each province includes the boundary; the area generally by length and breadth in miles between extreme limits and seldom by area in square measure; division of the province into districts and *parganas* with a long list of place names under each district or *pargana*; revenues, both according to Manouzzi[2] and register of the empire mentioning the largest and the smallest sum in most cases; a fairly-detailed description of the capital and succinct description of a number of important places; itineraries; succession list of kings and rulers, sometimes mentioning the length of government of the ruler in years, months and days but not in strict chronological order according to one era.

Interspersed with this general pattern of description will be found notices of rivers, their tributaries and distributaries traversing the province, with their names, sources, mouths, courses determined by a large number of places, large and small, on their banks, and several other characteristics such as seasonal variations in the discharge of waters, tides in rivers in the deltaic region,[3] shift of river beds,[4] irrigation canal systems fed from certain rivers,[5] and the like. The river systems in the Ganges and the Gogra basins, especially those irrigating the province of Oudh, have been noticed with the greatest detail, as may be expected from one who spent long years in surveying these areas. Rennell utilized much of Tieffenthaler's findings in revising his map and the second edition of his *Memoir.* 'The upper part of the course of the Ganges,' he writes, 'to the Cow's mouth, or cavern through which the Ganges passes; and the course of the Gogra river to its fountains; are both inserted from the work of M. Bernoulli.'[6] In another passage he records his acknowledgement to the discoveries concerning the Ganges and the Gogra as follows: 'A late publication by M. Bernoulli (who has done me too much honour in the course of it) contains, among a variety of other matters, a map of the courses of the Ganges and Gogra rivers; drawn by M. Anquetil du Perron, from the materials of the late P. Tiefentaller. This map is highly interesting, on the score of its containing the course of the Ganges, as high up as the *Gangoutra*, or cavern, styled by the Hindoos, the Cow's mouth; and which is near 300 miles above the place where the Ganges enters Hindoostan: as well as the course of the Gogra river, to its source, in the western part of Thibet.'[7] Rennell, however, criticized Tieffenthaler for stopping short at a place not far within

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1 Names of provinces are here spelt after Bernoulli's French version, Vol. I, and further printed in *italics* to differentiate them from modern spellings in English, which the reader must have noticed already. Figures within parentheses indicate page references to Vol. I.

2 Tieffenthaler in his manuscript spelt the name as 'Manucci', also a very common form of spelling in English (*vide* W. Irvine's English translation of *Storia do Mogor*, John Murray, 1907–8). In French, the name is written as 'Manouchi' as may be seen from the French version of his work, *Histoire générale de l'Empire du Mogol depuis sa fondation. Sur les mémoires portugais de M. Manouchi, venitien, à la Haye*, 1708. But the physician, as Bernoulli has pointed out, was known in his homeland of Venice, Italy, as 'Manouzzi' and referred to as such in Italian bibliographies (I, 15, footnote).

3 I, 456.

4 I, 291–292. The river *Sardjou* near *Bozpur* where it falls into the *Ghagra*.

5 I, 138–214.

6 *Memoir*, iii. Rennell generally mentioned Bernoulli's name and occasionally Tieffenthaler's for reference to the *Geography*.

7 *Ibid.*, 307–8. Mark Rennell's spelling of Tieffenthaler; Bernoulli informed us that Tieffenthaler himself spelt his name as 'Tieffentaller', although his family name should be correctly spelt as 'Tieffenthaler'. Following the pronunciation in vogue in Austrian Tyrol, his name could also be written as 'Tiefentoller', but he never wrote so (Bernoulli, Preface, XVI).

the Kumaun mountains, and not visiting the source of the Gogra himself as he did the Gangotrī, as also for neglecting to take observations for the purpose of determining the latitudes of either of the sources of these two rivers, 'which, on a course approaching to meridional, would have furnished a rule for correcting the distances'. Regarding the accuracy of Tieffenthaler's survey, it may be noted that Rennell compared the course of the Jumna above Delhi and other positions in that part of the Doab, as determined by Col. Polier's map, with the details given in the *Geography* and found that 'they accord generally with the notices in Bernoulli'.[1]

Another noticeable feature of the *Geography* is the details of itineraries and routes, given province by province, making it possible to reconstruct an excellent route map of eighteenth-century India. These routes are extremely detailed for those provinces over which he travelled, e.g. Delhi, Agra, Allahabad, Oudh, Ajmer, and Gujarat, oftentimes noting places even three or four miles apart. Bengal and Bihar are poorly served by itineraries by road due probably to his travels by inland waterways. Regarding other provinces, details were drawn from the accounts of other travellers as well as from Persian treatises. There is little difficulty in believing that Tieffenthaler's *Geography* served as an excellent guide-book for travellers in the last decade of the eighteenth and the first few of the nineteenth century. Rennell found Tieffenthaler's itineraries very useful in checking and correcting distances between places in his map and comparing the values derived from other sources. 'And what, moreover, I consider as an irrefragable proof of the general accuracy of the position,' writes Rennell concerning the bearing of Sirhind from Delhi, 'is that Mustaphabad, which stands in Col. Polier's map at 42 *cosses*, from Sirhind towards Hurdwar, is by Bernoulli's account (Vol. I, pp. 146, 147) 46 *cosses* from Hurdwar, by which the interval between Sirhind and Hurdwar should be 88 *cosses*: and it is actually 90 by the construction.'[2] Tieffenthaler's itineraries of the Punjab province also proved very valuable among the various materials Rennell used for filling up much of the detail of this province; e.g. the distance of Rahoon (*Rahan*) from Sirhind (*Sarhind*),[3] the position of Kullanore (*Calanór*)[4] on the Ravi, and so on. The itinerary from *Matschivara* to *Zouálamouki* (I, 112–113) enabled Rennell to fix up the positions of Bejwara (*Bezvára*), Rajapour (*Radjpour*), Hureepour (*Haripor*) and Jellamooky. 'Bejwara, called also Hoshearpour, is 3 journeys (perhaps 36 *cosses*) from Sirhind (Bernoulli); . . . Hureepour is 11 *cosses* beyond Rajapour, on the same road; Jellamooky 6 or 7 farther. All these particulars are from Bernoulli: and we collect from them that Hureepour is 21 *cosses*; or about 30 G. miles from Bejwara; 84 from Sirhind.'[5] For arriving at the conclusion that 'Moultan cannot be lower than the parallel of $30\frac{1}{2}°$', and for fixing its latitude at 30° 34′, Rennell consulted, among other authorities, Bernoulli's opinion that by the itineraries, 'Moultan cannot be much lower than that parallel'.[6] Bernoulli translated Tieffenthaler's findings as follows: 'La hauteur du pôle boréal est ici de 29° 51′; . . . Des Auteurs plus au fait font

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1 *Memoir*, 69.

2 *Ibid.*, 68. Rennell obviously consulted Bernoulli's French edition, where the distance between *Mastabad* (Mustaphabad) and *Saharanpour* is given as 22 Indian miles (*cosses*) and that between *Saharanpour* and *Hardouar* (Hurdwar) as 24 Indian miles (1, 146, 147).

3 *Ibid.*, 79.

4 *Ibid.*, 105.

5 *Ibid.*, 106–107.

6 *Ibid.*, 90–93.

la Latitude de *Moultan*, de 30 degrés; mais on fera encore mieux de lui en donner 31; car les itinéraires preuvent quélle ne peut être plus petite.'[1]

Unlike Rennell, who usually avoided describing Indian cities on the ground that 'the description of one Indian city is a description of all; they being all built on one plan, with exceeding narrow, confined, and crooked streets; with an incredible number of reservoirs and ponds, and a great many gardens, interspersed',[2] Tieffenthaler described a large number of capital as well as fortified cities, carefully recording architectural details of palaces, forts and citadels with their ramparts and towers, mausoleums, brick buildings of the rich, the thatched and mud houses of the poor, market-places, etc., thus bringing out an impressive variety despite a common pattern and uniformity of plan. In general, the Indian cities were inferior to those of Europe in regard to magnificence, height and symmetry of the buildings and the uniformity of the streets.[3] To this a remarkable exception was Jaipur, the new city built in 1725 by Jai Singh, the curious astronomer king. Contrary to the unequal and narrow streets and antique buildings of old cities, the city was provided with large, long and straight roads, and buildings and shops for the display of merchandise, all equally spaced from one another, giving it a brilliant modern look.[4] The principal road extending from the gate of Sangener to that in the south was so spacious that six or seven carriages could easily run side by side without either touching or the necessity of one carriage moving in front of the other. In Delhi, the houses of the rich were outwardly unimpressive, though not indicative of negligence; but their interiors were magnificent and profusely decorated according to the style of the country and the taste of its people.[5]

Tieffenthaler also refers to the skill of Indian engineers in building stone bridges over rivers. He noticed and described such a bridge over the river Sindh near Narwar (Plate I); it was supported by 24 high and spacious arches.[6] Other stone bridges noticed by him include one of 16 large arches spanning a torrential river near Dholpur in Agra province,[7] one built on the Gumti,[8] and a small one built on the rivulet Rend near Corra.[9] At *Mohan* in the province of Oudh, the river *Sei* was spanned by a bridge built of brick and lime upon 15 supporting arches, and provided with balustrades and two towers at either extremity to serve as ornament.[10]

The cave-paintings of Ellora did not fail to attract his notice or extract eloquent appreciation from his pen; but the omission of Ajanta is baffling. He was full of admiration for 'une varieté de figures d'hommes & de Dieux, taillées avec un art étonnant', and further writes:

'Cette scene si artistement représentée est ouverte aux yeux de ceux qui traversent ces cavernes mêmes; elle reste cachée à ceux qui se trouvent en dehors. Qui pourroit n'être pas stupéfait des travaux de l'ancien tems, de la prodigalité des hommes, de l'abondance des richesses & de l'ardeur avide de transmettre son nom à la postérité!'[11]

(Those who walk inside the caves themselves can see this scene so artistically represented; it remains hidden to those who are outside. Who

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[1] I, 116.
[2] *Memoir*, 58.
[3] I, 126.
[4] I, 315.
[5] I, 125.
[6] I, 178.
[7] I, 188.
[8] I, 230.
[9] I, 235.
[10] I, 270.
[11] I, 486–87.

could fail to be stupefied by such works of ancient times, by the prodigality of men, by the abundance of their richness, and by the ardent earnestness to transmit their name to posterity !)

Mention should also be made of Tieffenthaler's description of the astronomical observatories set up by Rājā Jai Singh at Delhi,[1] Muttra,[2] Jaipur[3] and Ujjain.[4] Banaras observatory built by Rājā Man Singh of Amber at the beginning of the seventeenth century and further extended and equipped by Rājā Jai Singh[5] was strangely enough not noticed by Father Tieffenthaler in his *Geography*.

Other matters of scientific interest in which the book abounds concern soil, vegetation, food and agriculture, climate, flora and fauna and mineral resources. Tieffenthaler's classification of soil does not go beyond such generalized statements and phrases as 'fertile', 'sandy', 'waterless', 'black', 'uniform', 'sterile', etc. He records the soil of Lahor as very fertile, producing all kinds of fruits in great quantity; the canton extending from Lahor to Attock produces millet and other legumes.[6] The soil of the canton of Beluchistan is 'sandy and devoid of water' and produces nothing except millet during the season of scanty rain; wheat, however, grows on the river bord of the Sindh and on irrigated fields.[7] The quality of soil between *Atter* and Agra is sandy, but it nevertheless produces in abundance wheat, diverse species of fruits and vegetables. Soil between Agra and Jaipur is fertile and 'produit du froment, des lentils, des pois, du sucre & du millet'.[8] Fertile black soil is noticed near *Scheupori* south of Narwar in the Agra province.[9] In the district of *Tourhot*, Bihar, the soil produces all kinds of foodstuff, e.g. fruits, wheat, rice, pear and other provisions unknown in Europe.[10] The great fertility of the plains of Bengal is expressed thus: 'This province is extremely vast, and abounds in everything producing wheat, rice and many other kinds of provisions as well as Indian pears, ananas, jackfruits (*Kateles*, probably a corrupt form of the Bengali name *Kānṭhāl*), and long figs.'[11]

Tieffenthaler notices European climate in the province of Kabul where 'in winter it snows and water freezes'.[12] The country between Kabul and Attock often misses rainfall. The climate of Agra with seasonal changes all the year round is described in great detail, including its dust-storm which sometimes 'hides the sky from view and covers everything with a thick (layer of) dust'.[13] In Calcutta, a breeze from the south ordinarily prevails since the month of April up to October; during the rest of the year the wind blows from the north; the eastern wind is pestilential.[14]

As to the references to various kinds of trees, here is a typical passage describing trees of the region between *Balrampour* and *Pethana* in the province of Oudh. 'Among the trees of large species which this wooded and

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[1] I, 128.
[2] I, 201–202.
[3] I, 316–18. An English translation of the Jaipur observatory as described by Tieffenthaler was given by G. R. Kaye: *A Guide to the Old Observatories at Delhi, Jaipur, Ujjain, Benares.* Calcutta, 1920, pp. 48–50.
[4] I, 346–47.
[5] Kaye, 56–57.
[6] I, 102.
[7] I, 119.
[8] I, 208.
[9] I, 179.
[10] I, 421.
[11] I, 438.
[12] I, 68.
[13] I, 165.
[14] I, 458.

mountainous country produces may be mentioned the Larch-tree (Mélèses) and those known as *Sàl* or *Sakou* and *Corou*. The smaller trees include, among others, the *Tschischoum*, the *Bèl*, which produces a ball-like fruit full of soft marrow enclosed in a hard shell. Moreover, one finds fruit trees such as *Am*, the Tamarind, the *Bèl* or the *Carambolier* (*Malus indica*), and the Myrobalan trees.'[1] Notice the absence of proper botanical nomenclature of which Bernoulli complained.

Tieffenthaler has given fairly detailed description of the salines of the Behat district in Lahor province, with an interesting note on the *Khocares* or *Gacares*, a class of people engaged in salt-mining operations.[2] Notices to salines in other regions include those of Nasirabad[3] in Allahabad province, and of Cambay in Gujarat and details of salt manufacture from the Salt Lake of *Sambhar*[4] and in the Cambay area. The *Geography* mentions deposits of iron ores in the country of Savad[5] (Swat), west of Kashmir; magnetic iron ores in the district of Narwar[6], at *Dhoa*[7] and on the route between Anteri and Gwalior[8], copper and silver near the village of Dariba[9] in the Udaipur district; copper in *Tschenpour*[10] in the Mandel district in Ajmer province and in *Tambacàni*[11] on the route from Bithia to Kathmandu; gold in Assam[12]; diamonds in Parna,[13] in Bundelkhand, in Sommelpour,[14] in Bihar, and in the province of Orissa.[15] Agate occurs in the mountainous country on the route between Surat and Broach and other neighbouring places.[16] The adjacent mountains of Ajmer are mentioned as sources for the best quality of marble,[17] and places like *Singauli* and *Rubas*, five leagues south of Fatehpur, as good sources of red and white stones.[18] References to mineral resources are brief and inadequate; one wishes the geographer would have given as much attention to the occurrences of mineral ores, marble, stone and other building materials as he had given to the saline rocks and salt manufacture.

In the same manner Tieffenthaler's scattered references to the crafts and manufacture and centres of commerce and industry left much to be desired. Like other travellers and geographical writers before or contemporaneous with him, he noticed the artistic excellence of the shawl (*schàl*) makers and woodworkers of Kashmir,[19] the centres noted for the manufacture of cotton piece-goods, e.g. *Rahon*[22] in the Lahor province, Cóláres[21]

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[1] I, 264: The Larch—*Larix griffithii*; the *S'āl*—*Shorea robusta*; the Tschischoum—*Dalbergia Sissoo*; the *Bèl*—*Aegle marmelos*; the *Ām*—*Mangifera indica*; the Tamarind—*Tamarindus indica*; the *carambolier*—*Averrhoea carambola*; the Myrobalan—*Terminalia chebula*.

[2] I, 104, 106.

[3] I, 238.

[4] I, 312–13.

[5] I, 78.

[6] I, 177.

[7] I, 180.

[8] I, 187.

[9] I, 327.

[10] I, 308.

[11] I, 425.

[12] I, 466.

[13] I, 246.

[14] I, 433.

[15] I, 460.

[16] I, 389, 391–92.

[17] I, 311.

[18] I, 170.

[19] I, 82.

[20] I, 112.

[21] I, 179.

in Narwar district, Sironj[1] in Malwa province, Baroda[2] in Gujarat, Bhagalpur[3] in Bihar, Katwa[4] and Dacca[5] in Bengal, and the sericulture in Bengal,[6] but hardly any detail is given. Of particular interest is his reference to *Beana, Hindon* and *Canben* in the Agra province as flourishing centres in previous times for indigo (*nīl*) cultivation, in which the Dutch and the Armenian merchants used to conduct a very lucrative trade and export a huge quantity of this dyestuff from Agra to Surat.[7] *Arol*, a city seven miles from *Schamschernagar* in the Bihar province, was a centre for paper manufacturing.[8] Of the European factories noticed mention may be made of Dutch factories in Ahmadabad, Broach, Surat, Patna, Chhapra, Murshidabad, *Calcapour* in Cossimbazar, and Chinsura; French factories at Surat, Chhapra, Cossimbazar and Chandernagore; the English factories at Cambay, Surat, Patna, Cossimbazar (a fortress was built here) and, of course, Calcutta. Daman and Diu on the Indian coast and Mozambique on the African used to participate in a Portuguese Indo-African trade in the course of which Indian merchandise were exchanged for African ivory and gold.[9]

Tieffenthaler's Sources

Bernoulli has reproached Tieffenthaler for neglecting to indicate the sources and references to such of the matters of his *Geography* as he did not observe himself.[10] It is true, remarks Bernoulli, that he named some European authors such as Pinhero, de Laet, Bernier and others and some oriental ones, e.g. Ferishta, Abul Fazl (or his work), Heder, whom he quoted or consulted. As to the former he should have named also Father Philippe, Thevenot and others and regarding the latter one wished he had given more particulars than merely mentioning the name or simply stating 'one reads in a Persian book', 'in an Indian work', etc., as he frequently did. Although this remark is generally correct, a fairly good idea as to his European sources can be obtained without difficulty from his statements in the course of which he sometimes quoted chapter and verse. But his silence on the inadequately known oriental sources about which his European readers would have welcomed his valuable bibliography is regrettable.

Tieffenthaler's sources and authorities clearly referred to by himself and amplified by the researches of both Anquetil and Bernoulli are given below:

Aristotle: Referred to in Ch. XI on 'Ancient India' in connection with the Indus and its source, e.g. 'Suivant *Aristote*'. Reference to be found in *Edit. du Val*, 1654. T. I.: *Meteorol*, p. 768. (A)[11]

Arrian: Referred to in Ch. XI: 'Arrien fait mention de PEUCELIOTIS', a city on the Indus, known by the name of *Acòra* in Tieffenthaler's time, 12 miles from Attock.[12]

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1 I, 349.
2 I, 393.
3 I, 435.
4 I, 453.
5 I, 458.
6 I, 438.
7 I, 172.
8 I, 434.
9 I, 396, 406.
10 Bernoulli, Preface, XIX.
11 I, 44. (A) indicates Anquetil du Perron who located the source.
12 I, 48.

'Ain-i-Ākbari: Described as 'Ouvrage Persan qui a pour titre : Ayn Akbari ou la méthode d'Akbar'.[1] Details of latitudes and longitudes of places in India, route mileage, etc., as observed or recorded by Persian geographers were taken from this work. Also an important source book for much of his materials given in his description of provinces. Rarely did he either refer to the work or quote from it in marked contrast to his treatment of other sources like the Bible or Quintus Curtius. Such a rare example is: 'On lit dans l'ouvrage Persan qui a pour titre *Ayn Acbari*, que les Rajahs *d'Odépour* tirent leur origine de *Noschervân* surnommé le *juste*, Roi de Perfe'.[2] At the time of Bernoulli's editing and translating Tieffenthaler's *Geography*, the *'Ain* was known to European scholars through a notice of Anquetil in the *Législation Orientale*, Amst., 1778, and Gladwin's translation of a portion only (concerning descriptions of the *subahs* of Bengal and Orissa) of the Persian text, published in London, 1777 (Gladwin's translation of the whole *'Ain* was published in Calcutta in 1783–86). Bernoulli was unable to obtain a copy of the translation, but learnt from a Göttingen journalist who had compared his German translation of Tieffenthaler's *Geography* with Gladwin's translation of *'Ain* that there were considerable enough differences despite many similarities in passages.[3] It is now known that Tieffenthaler drew heavily upon the *'Ain*, bodily incorporating details concerning the subdivisions of *Sarkars* into *Mahals* and succession list of rulers and giving verbatim translation of several passages. For example, compare the following passage from Bernoulli:

'Thorabhim est une ville. A 3 milles de là est une fosse, dont le fond rempli d'eau ne peut se sonder. Dans cet endroit est aussi une mine de cuivre; & on y trouve de petits morceaux de turquoise',[4] with the following from the *'Ain*,

'*Todah Bhim* is a place at a distance of three *Kos*, from which is a pit full of water, the depth of which none has sounded. Mines of copper and turquoise are said to exist, but the expense of working them exceeds their income.'[5]

Bernier: Referred to in connection with his description of Kashmir, e.g. 'Bernier, savant écrivain qui parcourut le Cachemire sous le regne d'Aurengzeb'; and also in connection with the origin of the Kashmirians.[6]

The Bible: Referred to in Ch. VIII on 'References to India in the religious books' in connection with the discussion on *Ophir*; detailed references to book, chapter and verse are given, and sometimes passages quoted; e.g. 'Le nom de *l'Inde* se trouve encore dans le

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1 I, 18.

2 I, 340.

3 Bernoulli, Preface, XX.

4 I, 171.

5 *'Ain-i-Ākbari* of Abul Fazl-i-'Allami, Vol. II. Translated into English by Col. H. S. Jarrett. Second edition corrected and annotated by Sir Jadu Nath Sarkar. *Bibliotheca Indica*. Calcutta, 1949, p. 192. Hereinafter referred to as *'Ain*. *See also* the Editor's note on page 123 and footnotes elsewhere, according to which Tieffenthaler had a more correct and legible MS. of the *'Ain* before him from which he transcribed the place names in Roman letters without a mistake affording comparison and check-up in modern studies.

6 I, 80, 82.

Livre *d'Esther*, chap. 1, oū on lit au tems d'Ahassuerus qui regna depuis l'Inde jusqu'à l'Ethiopie sur vingt et sept provinces '.[1]

Boudier, Claude: Quoted extensively in connection with his latitudes and longitudes.

Curce, Quinte or Curtius Rufus, Quintus: Roman historian and biographer of Alexander the Great. Frequently referred to in Ch. XI, and also quoted; e.g. 'voici ce que *Quinte Curce* dit du Dyerdenes, Liv VIII (Ch. 9): etc.', followed by a quotation. *Edit.* Freinshemii. 1640.[2]

Danet: French geographer, whose values of latitudes and longitudes are quoted; as neither his full name nor his work was quoted, Bernoulli had difficulty in locating this source, the name being little known.[3]

De Barros, Iean: Portuguese historian whose account of India and the East Indies is contained in *L'Asia de Iean de Barros, Diego de Couto et autres*, an extremely rare book which enjoyed a great reputation for its historical veracity and for its narration. Bernoulli notes that the book was divided into ten parts, of which the first appeared in Lisbon in 1552, and a sufficiently complete copy, in 15 volumes, was in existence in France. Tieffenthaler referred to De Barros in Ch. X on the survival of the traces of Christianity in India since the Portuguese times.[4]

De Laet, Jean: Described as 'Jean de Laet d'Anvers, Historien soigneux autant qu'élégant' and referred to in Ch. XIII on the division of Hindustan into provinces. Author of *De Imperio Magni Mogolis sive Indiâ Verá. Lugd.* Batav., 1631, in 24°.[5]

De Sousa, François: Jesuit historian on India and author of *Oriente conquistado a Jesu Christo pe loi P. P. da Campan de Iesu, da Provinc. de Goa. Lisboa*, 1710.[6]

Heider Maler: The list of sovereigns of Kashmir was taken from Heider's (also spelt as Hédar) History of Kashmir.[7] The list agrees closely with the one given in the '*Ain*.[8]

Homann, I. B.: Tieffenthaler refers to his work once as 'suivant la carte plus modern', and again as 'Les cartes géographiques de Homann, publiées à Nuremberg en 1733'. The title of his map as given by Bernoulli is: *Imperii Persici in Omnes Provincias Tam veteribus quam modernis earundem nominibus signatas exacte divisi, nova Tabula geographica.*[9]

Manucci (spelt also as Manouzzi): Much used for the values of revenues given by him; and there is a critical discussion of the values of latitudes and longitudes given in his book. Tieffenthaler used the French translation prepared by the Jesuit Father François Catrou under the title: *Histoire générale de l'Empire du Mogol*

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[1] I, 31, 32, 35.
[2] I, 53.
[3] I, 15, 16.
[4] I, 40.
[5] I, 62.
[6] I, 40.
[7] I, 89, 97.
[8] '*Ain*, II, 370–85.
[9] I, 50, 53, 511.

depuis sa fondation. Sur les mémoires portugais de M. Manouchi, Venitien, à la Haye, 1708. First Paris edition, in two volumes, appeared in 1705, and the second, in four volumes, along with an account of Aurengzebe's reign, in 1715.

Mela, Pomponius: Referred to in Ch. XI on 'Ancient India' in connection with the time taken by a vessel to execute a voyage to and from India. Text used, as per Anquetil's note, was 'De situ orbis libri III, *edit. Gronov. Lugd. Bat.*, 1722'.[1]

Pinnero, Manuel: Portuguese Jesuit missionary resident in Cambay, who visited Lahor in 1594 and left letters about his travels. Jarrich refers to 40 such letters in his *Histoire de l'Inde.* Tieffenthaler cites Pinnero in connection with his discussion of Patalā, a city on the Indus.[2]

Pliny: Referred to in Ch. XI at several places. *Hist. natur. Edit., Harduini*, Paris, 1723.[3]

Polyaenus: Referred to in Ch. XI in connection with his discussion on Meros or Nysa, as called by Pliny. Author of *Stratag. edit., var*, 1691.[4]

Pompée, Trogne: Referred to in connection with Meros, etc., as stated above.

Ptolemy, Claudius: Referred to in Ch. XI at several places. *Edit. prim, Basil*, 1533. Libri VII. Also used for his historical discussion on latitudes and longitudes.

Shah Jahàn, History of: Tieffenthaler refers to the work by *Mohammed Salé* of Lahor, sometimes as 'on lit dans l'histoire de *Schah Djehan*,' sometimes as 'suivant l'Historien de *Schah Djehan*', in connection with the extension of India in latitude and longitude and itineraries in the provinces of Kashmir, Multan, etc.[5]

Strabon: Referred in Ch. XI. *Edit. Casaubon.* Libri XV, Paris, 1620.

In addition to the above, Tieffenthaler has referred to a large number of authors and works not by name but under such vague statements as 'following a Latin geographical dictionary', 'following a general map of Asia recently published in England', 'Oriental geographers', and so on. In this category of references the following works or authors appear indicated according to the researches of Anquetil and Bernoulli:

(i) 'Un Dictionnaire géographique latin' (I, 10): *Lexicon geographicum* of Philippe Ferrari (Ferrarius); published in Milan in 4°, 1627. The work is further mentioned on p. 50.

(ii) 'la Carte générale de l'Asia publiée denièrement en Angleterre' (i, 11): This probably refers to a map by Th. Jefferys.

(iii) 'Une Carte particulière qui représente l'Inde seule' (I, 11): This probably refers to the map, the *East-Indies with the Roads*, by Jefferys, 2nd edition in four leaves, 1768.

(iv) 'Une Carte publiée à Amsterdam' (I, 11): It probably refers to the maps published by Pierre Schenk or Witte. Elsewhere (I, 74), Tieffenthaler refers to maps published at Amsterdam by Schenk and Valk.

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[1] I, 44.
[2] I, 51–52.
[3] I, 45.
[4] I, 46.
[5] I, 22, 88, 118.

(v) 'Une autre carte publiée à Nuremberg' (I, 11): The reference appears to be to the maps entitled *Indes Orientales*, in two leaves, edited by Tob. Mayer after M. d'Après Mannevilette, and published by Homann in 1748.

(vi) 'Geographes Orientaux' (I, 13): Eminent Arab astronomers and geographers Ulūgh Beg and Naṣīr al-dīn al-Ṭūsī were meant. Tieffenthaler quoted the values of latitudes and longitudes as given by these authors but never mentioned them by name in marked contrast to other contemporary writers such as D'Anville[1] and Rennell.

(vii) '[& qui residoit probablement à *Kanóz* (ou *Kanoudj*) ville grande & ancienne, & non à *Tschitor*, comme Thomas Rhoe Chevalier Anglois l'a cru]': Anquetil notes that this reference was from Thevenot: *Recueil de voyages par Thevenot. t. I. Mém de Th. Rhoe*, p. 70.

(viii) 'On lit dans des Annales Persannes qui traitent des Faits des *Gasnavides*, que *Soumnath* est un lieu très fameux' (I, 401): This account was without doubt taken from *Ferishta*; the details given by Tieffenthaler can be compared with those contained in the *History of Hindostan* by Dow, I, 66–71, 1st edition.

The above list is only illustrative but not exhaustive.

I conclude the account with the following remarks of Anquetil: 'Whilst two leading European nations are contending in the Carnatic and elsewhere for the supremacy over India in many bloody encounters, a modest missionary quietly and perseveringly pushes his way through pathless jungles and over arid plains, measuring in all thousands of miles, in order to make purely pacific conquest, and benefit thereby humanity—whilst Bengal, the East Coast, the Deccan and Gujarat are the scenes of bloody strifes which the greed of European nations has, if not originated, at least fostered, it is consoling to see that there are still men of science who are untouched by avarice and free from the thirst of gold. We sincerely desire the examples of intelligent travellers like Tieffenthaler might be imitated by some of the Europeans settled in those vast regions. Of what use are the endless armed squadrons, sent thither to uphold material interests, and bring Asia's treasures to Europe whilst all means of advancing human knowledge are neglected? Prompted by the love of science, and filled with the zeal for the cause of humanity, I hope my wishes will be realized, and the public—I am sure—anxiously watch the efforts of this savant (Tieffenthaler) in the North of Bengal, and will receive with pleasure the results of his exploration in those hitherto little-known regions of Asia.'[2]

I take this opportunity to thank the authorities of St. Xavier's College, Calcutta, for kindly permitting me to use their Goethals Indian Library.

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I .. .. Bernoulli, Jean: *Description Historique et Géographique de l'Inde*. Vol. I: La Géographie de l'Indoustan, écrite en Latin, dans le pays même par le Pere Joseph Tieffenthaler, Jésuite & Missionnaire apostolique dans l'Inde. Berlin, 1786.

[1] *Éclaircissemens*, 17, 18, 20, 30, 38, 57, 76, 82.

[2] II. The English version quoted is from Noti, 411–12.

II ..	.. Bernoulli, Jean: *Description Historique et Géographique de l'Inde.* Vol. II : Des Recherches Historiques & chronologiques sur l'Inde & la Description du cours du Gange & du Gagra, avec une très grande carte—par M. Anquetil du Perron, de l'Acad. R. des Insc. & B. L. & Interprète du Roi pour les langues orientales, à Paris.
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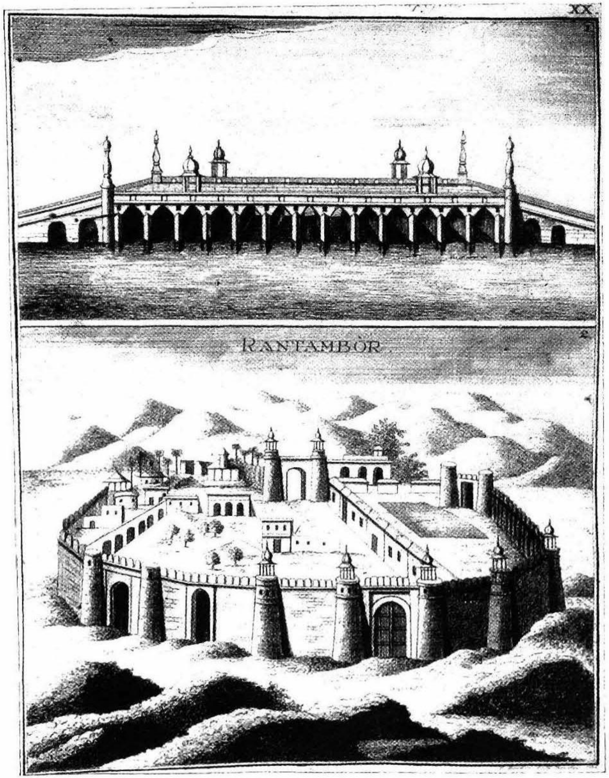
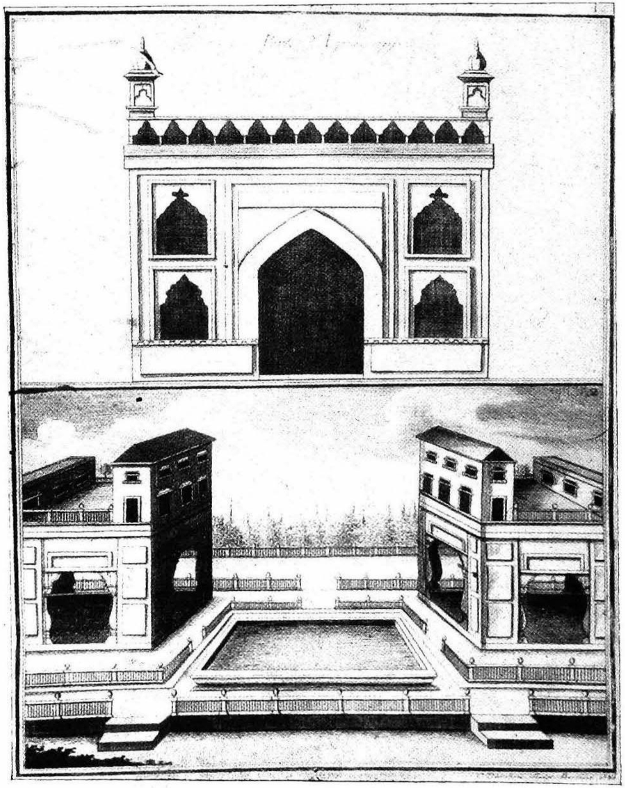
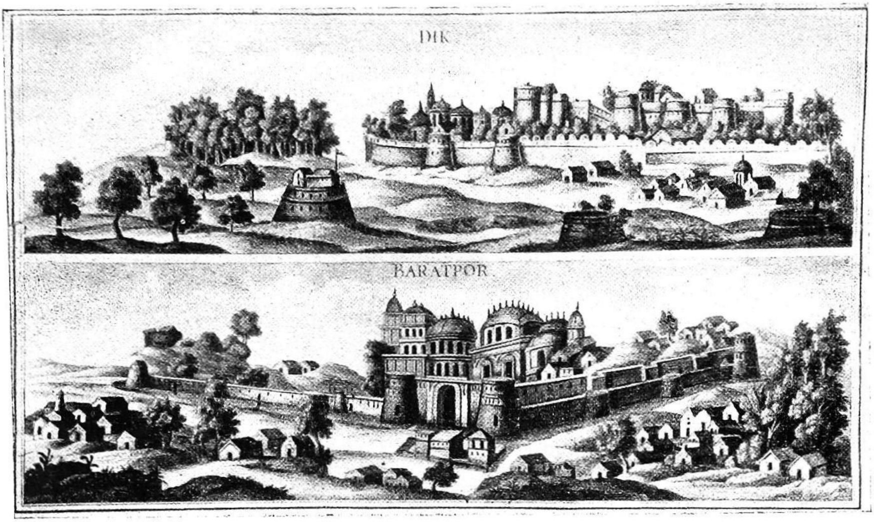


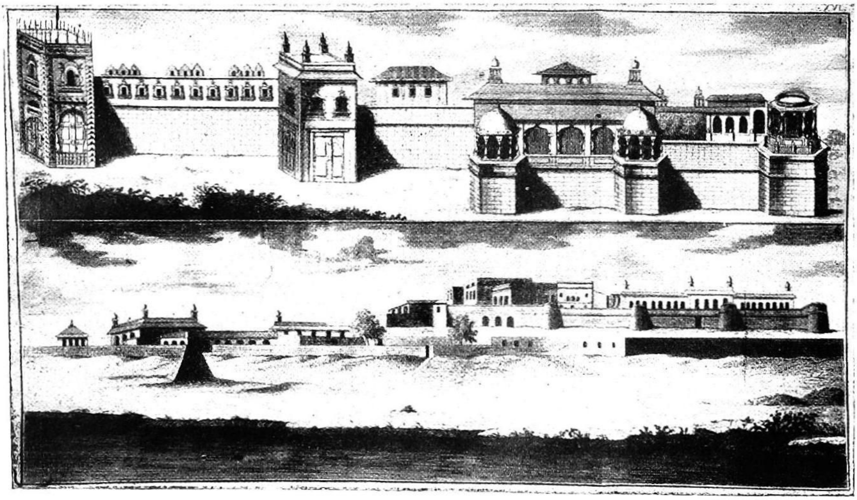
Top: The bridge of Narwar on the Sindh.
Bottom: The Ranthambhor Fort in the Province of Ajmer.



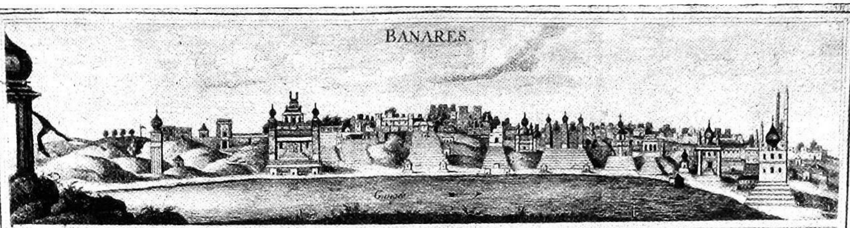
Top: Agra Gate. The French caption is in Tieffenthaler's own handwriting.
Bottom: Palace and gardens within the Delhi Fort.



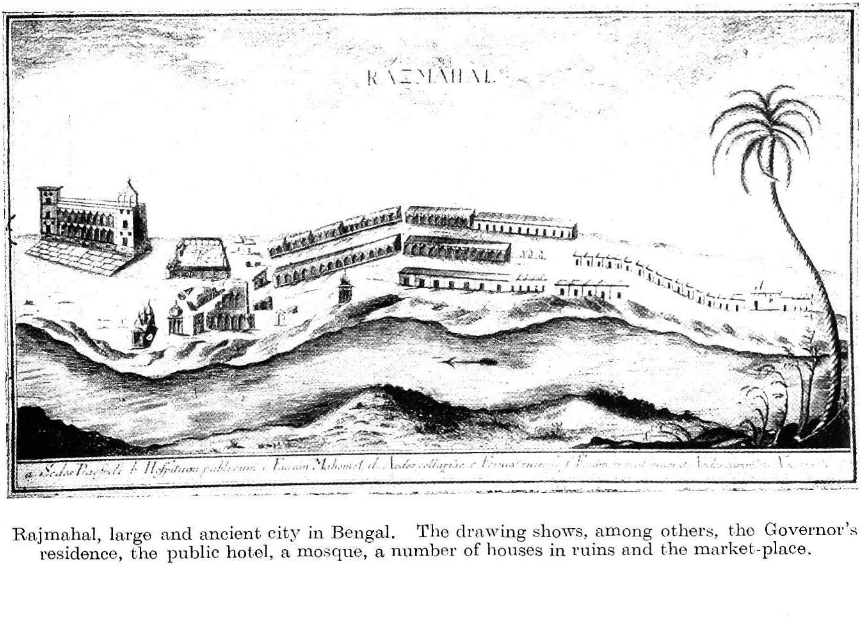
Top : Dig. The palace of the Rājā of the Jats is shown.
Bottom : Bharatpur. Another palace of the Rājā of the Jats.



Top : The palace recently constructed at Bangla or Fyzabad, a modern and one of the largest cities in the Province of Oudh, on the Gogra.
Bottom : The palace in Lucknow on the bank of the Gumti.

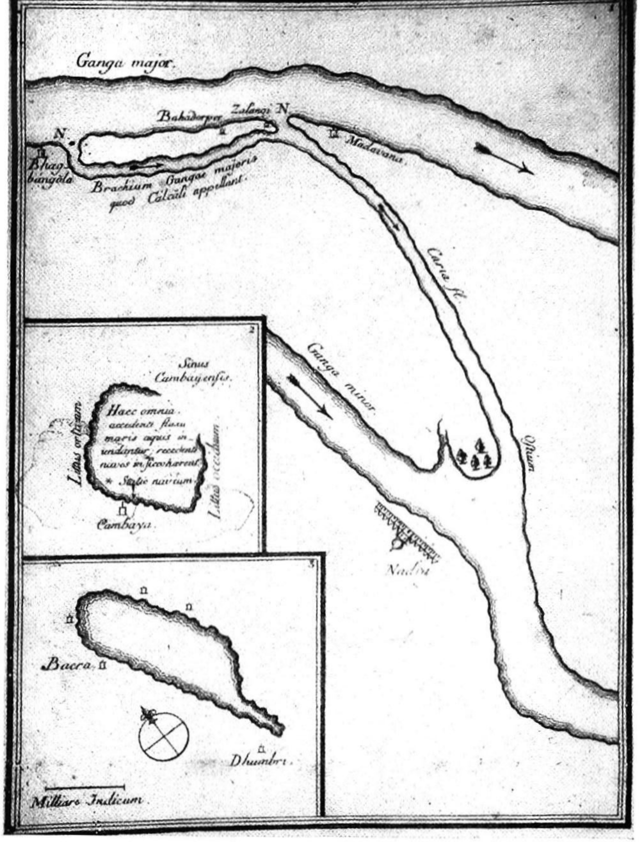


Top: Banaras, one of the most famous cities in India.
Bottom: Agra, capital of the Province of Agra.



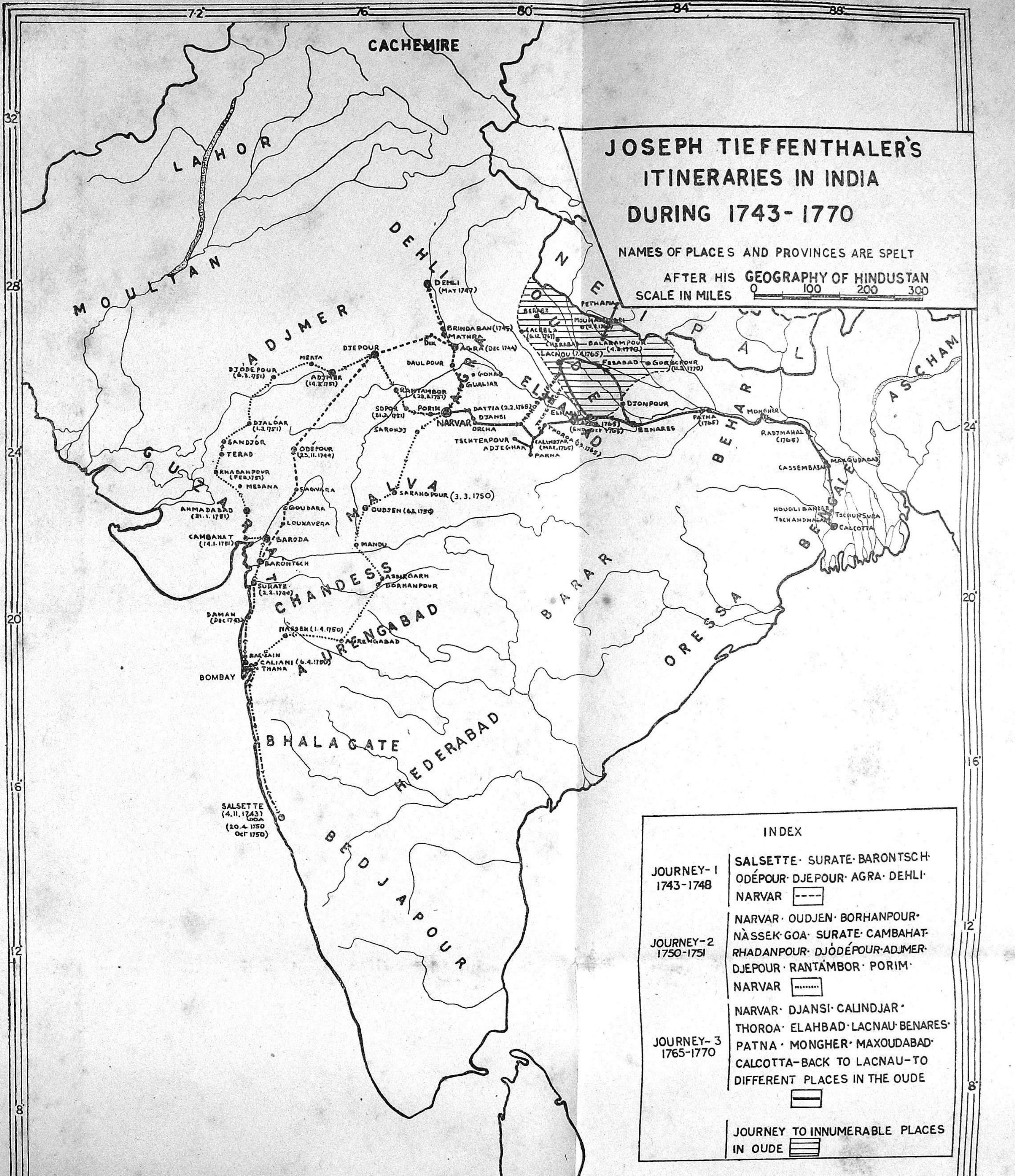
Rajmahal, large and ancient city in Bengal. The drawing shows, among others, the Governor's residence, the public hotel, a mosque, a number of houses in ruins and the market-place.

The famous pass at Sacrigali connecting Bengal with Bihar.



Drawing showing the river Caria joining the great Ganges (Padma) and the little Ganges near Nadia.

Upper Box: A sketch of the Gulf of Cambay



JOSEPH TIEFFENTHALER'S
ITINERARIES IN INDIA
DURING 1743-1770
NAMES OF PLACES AND PROVINCES ARE SPELT
AFTER HIS GEOGRAPHY OF HINDUSTAN
SCALE IN MILES 0 100 200 300
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A PRELIMINARY ACCOUNT OF BIONOMICS AND TAXONOMY OF APHIDS FROM ASSAM—II

By A. K. GHOSH *and* D. N. RAY CHAUDHURI

(Communicated by Professor J. L. Bhaduri)

INTRODUCTION

This paper gives an account of eleven species of aphids from Assam. Out of these, four have been collected during the first survey, and seven during the second survey of Assam carried out in the month of June, 1961.

Of the seven species, one is placed under a new genus, another under a new subgenus and a third one is described as a new subspecies. With regard to one species out of the remaining four, Dr. V. F. Eastop of British Museum (Nat. Hist.), London, writes to us that 'it is a member of the *Acyrthosiphon* or *Aulacorthum lespedezae/photinae* group'. Specific identification is not yet possible in view of paucity of materials and literature.

The total number of species from Assam now comes up to 25 distributed over 17 genera.

SYNOPSIS OF THE SPECIES

(1) *Aphis craccivora* Koch.

Morphological characters—Apterous viviparous female: Longest hair on III antennal segment $1–1\frac{1}{5}$ times as long as the basal diameter of the segment. Antennae imbricated, $\frac{3}{5}$ the length of the body; processus terminalis $2–2\frac{2}{3}$ times as long as the base of VI. Rostrum reaching almost the third coxae. Hairs on the dorsum of the abdomen with acuminate or slightly furcated apices. Siphunculi dark, cylindrical, imbricated. Cauda elongate with 6–9 hairs. First tarsal chaetotaxy 3.3.2.

Measurement of one specimen in mm.:

Length of the body	..	2·0
Length of the siphunculus	..	0·46
Breadth of the ,, at base	..	0·10
Breadth ,, ,, ,, ,, apex	..	0·05

Antennal segments: III : IV : V : VI–0·28 : 0·20 : 0·19 : (0·11+0·30)

Locality and host plants: Shillong (7.1.60) from *Hibiscus rosasinensis*; Tocklai (18.1.60) from *Ficus heterophyla*; Khasya and Jayantia Hills (2.6.61) from a plant of N.O. Euphorbiaceae.

Total number of specimens: 20 apterae.

The specimens were collected from undersurface of the leaves of the host plants. The specimens collected from the plant of N.O. Euphorbiaceae were visited by black ants.

(2) *Aphis gossypii* Glover

Morphological characters—Alate male: Body elongated oval. Head and thorax dark brown, abdomen pale. Dorsum of abdomen with two rows of marginal sclerites and a row of median sclerite of irregular shape:

marginal sclerite with irregular rows of spinules; ventrally the entire abdominal region with transverse rows of spinules. Hairs on the dorsum sparse, short, straight and with acute apices. Antennae dark brown, imbricated, a little longer than the body; segment III with 33-34 circular rhinaria of very different size, distributed almost over the entire length, except the very base; segment IV with 21, V with 13-14 similar rhinaria distributed irregularly; processus terminalis nearly thrice as long as the base of VI, and subequal to segment III. Apical segment of the rostrum bluntish, reaching second coxae, with 7 fine acute hairs, $1\frac{1}{5}$ times as long as second joint of hind tarsi. Siphunculi dark brown, short, stout, imbricated, broadest at base. Cauda short with about five hairs. Claspers with a process at their base, caudad (Fig. 1). Femora and tibiae smooth; apices of femora

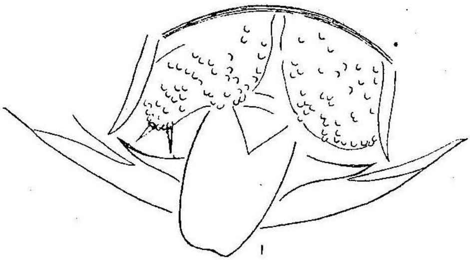


FIG. 1. *Aphis gossypii* Glover: male genitalia. × 235.

and tibiae dark brown, rest pale yellow. First tarsal chaetotaxy 3.3.2.

Measurement of one specimen in mm.:

Length of the body	.. 1·6	Antennal segments:
Breadth ,, ,, ,,	.. 0·78	III : IV : V : VI–0·42 : 0·33 : 0·28 : (0·13 + 0·38)
Antenna	.. 1·63	
Length of the siphunculus	.. 0·16	
Breadth ,, ,, ,,	.. 0·08	

Locality and host plant: Tocklai (18.1.60) from *Camellia sinensis.*

Total number of specimen: 1 alata.

Note: The specimen was collected along with *Toxoptera aurantii* from undersurface of the leaves of host plant. It appears to be closely allied to *gossypii* group; but it differs from the typical gossypii in having a median row of sclerites.

(3) *Aleuroidaphis blumae* v. d. Goot (additional description)

Takahashi, R., Aphididae of Formosa, Pt. 3, p. 98.

Morphological characters—Apterous nymph: Head and prothorax fused and almost equal to the fused meso- and meta-thoracic region. Last antennal segment subequal to segment III; processus terminalis 2·8–3 times as long as the base of the segment. Apex of rostrum stellate-shaped, reaching almost the middle of the abdomen; ultimate rostral segment 2–2·1 times as long as the second joint of hind tarsi. Knobbed hair on the second joint of hind tarsi, 1·8–2 times as long as the middle of the segment (Fig. 2).

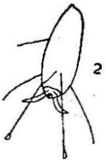


FIG. 2. *Aleuroidaphis blumae* v. d. Goot: second joint of hind tarsus. × 235.

Measurement of one specimen in mm.:

Length of the body	..	1·1
Breadth ,, ,, ,,	..	0·56
Antenna	..	0·33
Second joint of hind tarsi	..	0·06
Rostral segment 4+5	..	0·13

Locality and host plant: Khasya and Jayantia Hills (4.6.61) from *Cynoglossum wallichi.*

Total number of specimens: 4 apterous nymphs.

The specimens were collected from apical young shoots and buds.

(4) *Dactynotus* sp.

Morphological characters—Apterous viviparous female: Body yellowish, elongate oval. Head with well-developed frontal tubercles. Abdominal dorsum with irregularly scattered brownish sclerites of various shapes. Hairs on the dorsum of the abdomen placed on small sclerites, mostly with acuminate apices; longest hair may be up to $\frac{2}{3}$ the basal diameter of the segment. First antennal segment blackish brown with a few wax plates on the ventral side; segment II of same colour, faintly spinulose ventrally; segment III pale brown at base, rest brownish black, excepting $\frac{1}{4}$ part near the apex, with about 66 circular, very small and rather big rhinaria, distributed almost over the entire length, except basal $\frac{1}{10}$ and apical $\frac{1}{7}$ portions; the longest hair on III, $\frac{5}{7}$ the basal diameter of the segment. Rostrum reaches third coxae; rostrum with acuminate apex which may be up to $1\frac{3}{5}$ times the length of the second joint of hind tarsi. Siphunculi black, long, gradually tapering from base to apex, imbricated, apically $\frac{1}{6}$–$\frac{1}{7}$ reticulated, at base 6·6 times as long as the width at the middle of the hind tibia, at apex 2·6 times as long as the width at the middle of the hind tibia. Cauda pale, elongate, with 11–13 hairs, 3–$3\frac{1}{2}$ times as long as the width at base, about $\frac{1}{7}$ the length of the body, $\frac{3}{5}$–$\frac{3}{7}$ the length of the siphunculi. Femora stout, smooth, pale brown, excepting distal $\frac{1}{3}$ part which is black. Tibiae pale brown, except the very base and apical $\frac{1}{5}$ part which are black. First tarsal chaetotaxy 5.5.5.

Measurement of one specimen in mm.:

Length of the body	..	4·2	Antennal segments:
Breadth ,, ,, ,,	..	2·0	III—1·2 (rest broken)
Antenna	..	broken	
Length of the siphunculus	..	1·5	

Locality and host plant: Khasya and Jayantia Hills (5.6.61), host plant not identified.

Total number of specimens: 2 apterae, 10 nymphs.

The specimens were collected from the undersurface of leaves of a shrub.

Note: The specific identification is not possible at the present stage because of the scanty materials (with broken IVth antennal segment) in our collection and the lack of literature dealing with tropical and sub-tropical Dactynotus species. The available key to the European species starts with presence or absence of secondary rhinaria on the IVth antennal segment. So it is not possible to proceed with that key in view of the IVth antennal segment being broken.

* Genus *Chaetomyzus* nov. gen.

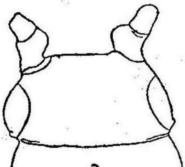
Typus generis *Chaetomyzus rhododendri* nov. spec. This species belongs to the tribe *Macrosiphini* but it cannot be placed in any of the known genera under the tribe and hence the erection of a new genus is imperative. The new genus is characterized by the following characters: (1) Prominent diverging antennal tubercles and low-rounded frontal tubercles; (2) In alatae, a number of tuberculate rhinaria all over the III antennal segment and a few on segment IV; (3) Presence of a number of pleural and spinal tubercles on the dorsum of the abdomen with acute or acuminate hairs; (4) Siphunculi swollen on both sides (Fig. 9B) and with a few spinulose striae at apex; (5) Presence of spinules in transverse rows in apical portion of tibiae and also over the tarsi; (6) First tarsal chaetotaxy 3.3.3.

(5) *Chaetomyzus rhododendri* nov. spec.

Morphological characters: Alate viviparous female (Plate I, fig. 1): Body elongate. Head and prothorax separate, both blackish brown. Head with low-rounded frontal tubercles (Fig. 3). Prominent diverging antennal tubercles present. Mesothoracic lobes well developed, dark brown. Dorsum of the head with a number of short and long hairs, with slightly acuminate apices. Antennae coloured like the body, and half as long as the body; basal $\frac{3}{7}$ of segment III smooth, apical $\frac{1}{4}$ very faintly imbricated, rest of the segments gradually more distinctly imbricated from base to apex; segment III with 43–46 small and large tuberculate rhinaria, distributed on all sides of the segment and over its entire length (Fig. 4); segment IV with 6–7 rhinaria of similar nature as on III (Fig. 5), but mostly present on its margin, the basal one being very small; segment V and apical portion of base of segment VI with usual primary rhinaria with hairy fringes. Hairs on segment III, present on all sides, those on the inner and outer margins short, with acute apices, rest stout and spiny; hairs on the rest of the segments arranged mostly on the outer and inner sides; longest hair on III, half as long as the basal diameter of the segment; processus terminalis $\frac{1}{2}$ to slightly less than $\frac{1}{2}$ the length of segment III, and $1\frac{3}{5}$ times as long as the base of the segment (Fig. 6). Apex of the rostrum blunt, reaching little beyond the third coxae, with about 12 fine, long hairs; ultimate rostral segment twice as long as the second joint of the hind tarsi (Fig. 7).

Dorsum of the abdomen with a number of spinal and pleural tubercles (number not clearly discernible) and with scattered, irregular pale brown patches. Hairs on the dorsum of abdomen mostly with acute or acuminate apices. Siphunculi slightly lighter in colour than the antennae, swollen, from basal $\frac{1}{3}$ towards apex (Fig. 9*b*), constricted at the very apex, $6\frac{1}{6}$

times as long as its maximum width, and $1\frac{7}{10}$ times as long as cauda, smooth, excepting apical $\frac{1}{7}$–$\frac{1}{8}$ part which is with 2-3 spinulose striae (Fig. 8); width at base equal to the width at the middle of the hind tibia, at middle $1\frac{5}{8}$ times the width at the middle of the hind tibia and at apex $1\frac{1}{4}$ times the width at the middle of the hind tibia. Cauda elongate, with 4 hairs. Femora and basal $\frac{4}{5}$ portion of tibiae coloured like the siphunculus, rest of the tibiae and tarsi darker; first and second joints of hind tarsi with transverse rows of spinules (Fig. 9*a*). First tarsal chaetotaxy 3.3.3. Fore wings broken, hind wings with two obliques.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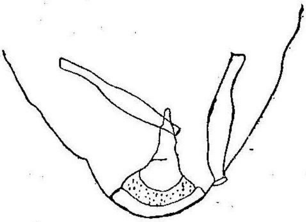
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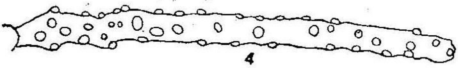
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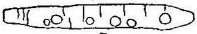
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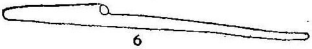
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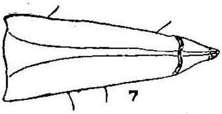
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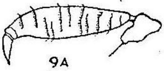
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FIG. 3. *Chaetomyzus rhododendri* nov. spec.: Head with frontal tubercles. × 59.
FIG. 4. *C. rhododendri* nov. spec.: III antennal segment (without hairs). × 125.
FIG. 5. *C. rhododendri* nov. spec.: IV antennal segment (without hairs). × 125.
FIG. 6. *C. rhododendri* nov. spec.: VI antennal segment (without hairs). × 125.
FIG. 7. *C. rhododendri* nov. spec.: Rostral segments 4+5. × 235.
FIG. 8. *C. rhododendri* nov. spec.: Apical portion of the siphunculus. × 235.
FIG. 9*a*. *C. rhododendri* nov. spec.: Hind tarsus (spinules not shown on first joint). × 235.
FIG. 9*b*. *C. rhododendri* nov. spec.: Posterior portion of the abdomen. × 59.

Measurement of one specimen in mm.:

Length of the body	..	1·8	Antennal segments:
Breadth " " "	..	0·64	III : IV : V : VI—0·43 : 0·20 : 0·15 : (0·12+0·20)
Antenna	..	0·9	
Length of the siphunculus	..	0·31	

Locality and host plant: Khasya and Jayantia Hills (8.6.61) from *Rhododendron arboreum.*

Total number of specimens: 1 alata and 2 apterous nymphs.

The specimens were collected from undersurface of a young leaf.

Apterous nymph: Body elongated oval. Head and prothorax fused. Abdominal segments not clearly discernible. Head with slightly diverging low frontal tubercles. Antennal tubercles prominent. Dorsum of the head with a number of long and short hairs with acuminate apices, longest of which is equal to the basal diameter of III antennal segment. Hairs on the dorsum of the abdomen very sparse, short and arranged in rows on tubercles. Meso- and meta-thoracic and abdominal tergites with a row of pleural tubercles on either side and two rows of paired spinal tubercles (Pl. I, fig. 2). Antennae six jointed, coloured like the body $\frac{5}{9}$ the length of the body; segment III smooth, rest of the segments gradually becoming more distinctly imbricated from base to apex; hairs on the segment III half the basal diameter of the segment; distribution of hairs similar to alata; processus terminalis about $\frac{4}{5}$ the length of the III and twice the base of the segment. Apex of the rostrum blunt, reaching at least the middle of the abdomen, with about 12 long hairs, and twice as long as the second joint of the hind tarsi. Siphunculi slightly darker than the body, swollen as in alata, $4\frac{2}{3}$ times as long as the cauda, smooth, with faint striations near the apex; width at base 1·2 times the width at the middle of the hind tibia, at middle 1·5 times the width at the middle of the hind tibia, and at apex equal to the width at the middle of hind tibia. Spinal tubercles on seventh abdominal tergite prominent, $1\frac{1}{3}$ times as long as the cauda. Cauda short, with 3–4 hairs. Femora pale like the body, and smooth. Tibiae darker than the femora, spinulose on the distal half, but densely so more towards the apices. Tarsi with rows of spinules; first tarsal chaetotaxy 3.3.3, with a median stout hair. Empodial hair stout, and rather long with acute apices.

Measurement of one specimen in mm.:

Length of the body	..	1·3	Antennal segments:
Breadth " " "	..	0·64	III : IV : V : VI—0·26 : 0·8 : 0·8 : (0·8+0·16)
Antenna	..	0·77	
Length of the siphunculus	..	0·27	

* Dr. V. F. Eastop (British Museum) writes to us: 'It sounds that your *Rhododendron* aphid may turn out to be a new species or even a new genus' (personal communication 4.4.62).

Macrosiphum (*Sitobion*) *avanae* subsp. *miscanthi* Takahashi

This species has been described by us as *Macrosiphum* (*Sitobion*) *fragariae* (Walker) previously (1962).

(6) *Myzus ornatus* Laing

Eastop, V. F. (1958). *Aph. East Africa*, p. 54.

Morphological characters—Apterous viviparous female: Longest hair on the III antennal segment may be up to $\frac{3}{8}$ the basal diameter of the

segment. Antennae imbricated, $\frac{1}{2}$–$\frac{5}{8}$ the length of the body; processus terminalis $2\frac{1}{2}$ times as long as the base of VI. Rostrum reaching beyond the second coxae. Hairs on the dorsum of the abdomen very short, with acuminate apices, and may be up to $\frac{3}{7}$ the basal diameter of the III antennal segment. Siphunculi long, imbricated, swollen on the outer side near the base. Cauda with 4–6 hairs.

Measurement of one specimen in mm.:

Length of the body	..	1·7	Antennal segments:
Siphunculus (length)	..	0·38	III : IV : V : VI—0·30 : 0·16 : 0·14 : (0·07+0·18)
Breadth of the siphunculus at base	..	0·06	
Breadth ,, ,, ,, ,, middle	..	0·05	
Breadth ,, ,, ,, ,, apex	..	0·03	

Locality and host plant: Shillong (7.1.60) from *Duranta plumeiri.*
Total number of specimens: 12 apterae.

The specimens were collected from undersurface of the leaves of the host plant along with *Myzus persicae* (Sulz.).

(7) *Nippolachnus pyri* Mats.

Matsumara, S. (1917). *J. Coll. Agric. Sapporo.*, Vol. **7**, p. 382.

Morphological characters—Apterous viviparous female: Longest hair on III antennal segment, $2\frac{1}{2}$–$2\frac{3}{4}$ times as long as the basal diameter of the segment. Antennae smooth, $\frac{1}{4}$ the length of the body; processus terminalis $\frac{4}{5}$ the base of the segment VI. Rostrum reaching beyond the second coxae. Hairs on the dorsum of the abdomen very long with acute apices. Siphunculi on hairy cone. Cauda semicircular, with many long acute hairs.

Measurement of one specimen in mm.:

Length of the body	..	2·5	Antennal segments:
Diameter of the siphunculus	..	0·06	III : IV : V : VI—0·14 : 0·06 : 0·09 : (0·08+0·06)

Locality and host plant: Shillong (12.1.60) from *Pyrus khasyana.*
Total number of specimens: 2 apterae and 24 nymphs.

The insects were collected from young growing portions of stem.

(8) Genus *Paratrichosiphum* Takahashi, 1931.

Neoparatrichosiphum nov. subgen.

Typus subgeneris *Neoparatrichosiphum khasyanum* nov. spec. The specimens collected from the host plant *Quercus* sp. belong to the genus *Paratrichosiphum* Takahashi, in not having spinulosity on the dorsum. It also agrees with *Holotrichosiphon* Ray Chaudhuri in having long and short siphuncular hairs with different apices. Since in other major characters it agrees with *Paratrichosiphum* Takahashi, it is in the fitness of things that a subgenus *Neoparatrichosiphum* is erected with *N. khasyanum* sp. nov. as the type, in view of the siphunculus having mixed hairs at least near the bases. The key will read as follows:

Dorsum not spinulose—Genus *Paratrichosiphum* Takahashi s.l.

A. (B) Siphuncular hairs all long and with acute apices—*Paratrichosiphum* subgen. s.s.

B. (A) Siphuncular hairs of different lengths, with various types of apices, at least near the base—*Neoparatrichosiphum* nov. subgen. typus subgeneris *Neoparatrichosiphum khasyanum* nov. spec.

Paratrichosiphum (*Neoparatrichosiphum*) *khasyanum* nov. spec.

Morphological characters—Apterous viviparous female (Pl. I, fig. 3): Body pear-shaped, about 1·86–2·0 mm. long with 0·92–1·0 mm. as maximum width. Tergum sclerotized, yellowish brown to dark brown, cephalic and thoracic tergites paler. Head and thorax locally spinulose, rest spinulose all over, more densely on the margin. Numerous long and rather short dorsal hairs occur intermingled, those on the dorsum of the abdomen mostly broken, the longer ones with acuminate or slightly furcated apices (Fig. 12);

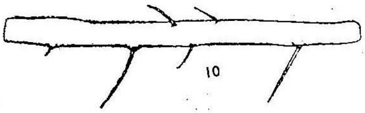
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FIG. 10. *Neoparatrichosiphum khasyanum* nov. spec.: III antennal segment. × 117·5.

rather short hairs on the dorsum of the abdomen may be up to about 3·1 times the basal diameter of III antennal segment; shortest hair up to about 0·84 times as long as the mentioned diameter. Seventh abdominal tergite with two rather short hairs of more or less similar length, with acuminate apices, up to about 3 times as long as the basal diameter of III antennal segment; eighth tergite with two hairs with acute apices, up to about 3·1 times the mentioned diameter.

Antennae pale, 0·55 times as long as the body, with segments I and II slightly darker; basal half of segment III faintly imbricated, rest of the flagellum gradually more distinctly imbricated; processus terminalis about 1·1 times as long as the base of VI, and about 0·66 times as long as III antennal segment; long and short hairs occur intermingled (Fig. 10), longer

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FIG. 11. *Neoparatrichosiphum khasyanum* nov. spec.: Rostral segments 4+5 (without hairs). × 156·7.

ones on the inner margin and shorter ones on the outer; long hairs with acute or slightly acuminate apices and short ones with acute apices; longest hair on segment III about 3·4 times as long as the basal diameter of the segment. Apex of the rostrum reaching beyond the hind coxae; segments 4+5 long and acute (Fig. 11), about 2·7 to 3 times as long as the second joint of the hind tarsi; segment IV about 5·9 to 6 times as long as the segment V, with about 10 fine hairs. Siphunculi pale brown, with slightly darker apices, about 0·25–0·27 times as long as the body (Fig. 13*a*), constricted at base and apex, curved outwards and with no trace of reticulation even at the base, about 5·1–5·5 times as long as their maximum widths, which are nearly at the middle; at base 2·6–2·8 times as thick as the middle of the hind tibia, at middle 3·5–4·4 times as thick as the middle of the hind tibia,

and at apex 1·7–1·8 times as thick as the middle of the hind tibia; long and short hairs occur intermingled; long hairs with acute apices while short

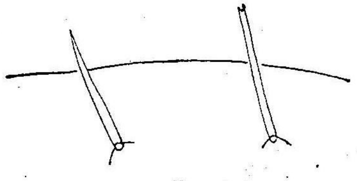


FIG. 12. *Neoparatrichosiphum khasyanum* nov. spec.: Two hairs on the dorsum of the abdomen. × 235.

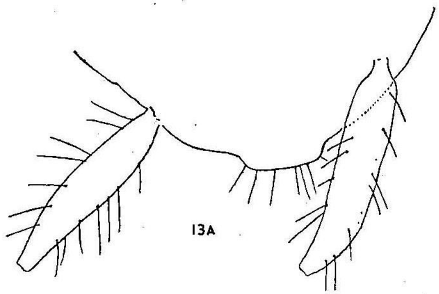


FIG. 13*a*. *Neoparatrichosiphum khasyanum* nov. spec.: Siphunculi. × 69.

ones with acuminate or slightly furcated apices, at least near the bases (Fig. 13*b*); longest hair about 2–2·1 times as long as the basal diameter of

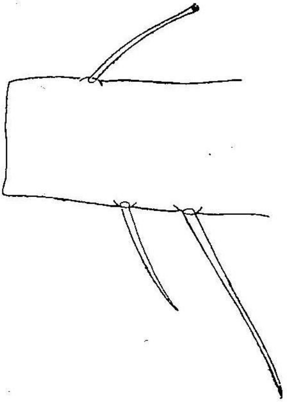


FIG. 13*b*. *Neoparatrichosiphum khasyanum* nov. spec.: A few hairs on the basal part of the siphunculus. ×235.

the siphunculus, shortest hair about 1·3 times as long as the basal diameter of siphunculus; acute spinules present, in distinct transverse rows on about apical $\frac{1}{5}$ part and more dispersed over the rest of the surface. Cauda obtuse, no stylus, with about nine hairs. Legs pale, yellowish brown; femora faintly spinulose, with transverse striae on the ventral side; tibiae smooth, without any apical tuft of spines.

Measurement of one specimen in mm.:

Length of the body	..	2·0	Antennal segments:
Breadth „ „ „	..	1·0	III : IV : V : VI—0·38: 0·14 : 0·17 : (0·17+0·20)
Antenna	..	1·11	
Length of the siphunculus	..	0·56	

Locality and host plant: Khasya and Jayantia Hills (10.6.61) from *Quercus* sp.

Total number of specimens: 2 apterae.

The specimens were collected from the undersurface of hairy leaves of the host plant.

(9) *Paratrichosiphum* sp.

Morphological characters—Alate nymph: Body elongated, pale, about 1·6–2·1 mm. long, with 0·55–0·99 mm. as maximum width. Tergum pale. Dorsum of the abdomen with very long and rather short hairs intermingled, long hairs with acuminate or furcated apices, shorter ones also with similar apices; longest hair on anterior abdominal tergites up to about 2·5 times as long as the basal diameter of III antennal segment; shortest hair up to about 14 times the basal diameter of III antennal segment; seventh abdominal tergite with two hairs, with acuminate or furcated apices (Fig. 14), up to

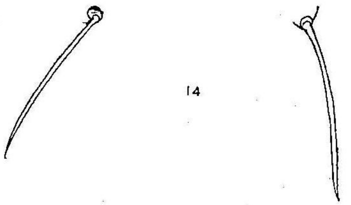


FIG. 14. *Paratrichosiphum* sp.: Hairs on seventh abdominal segment. ×235.

about 1·9–2·2 times as long as the basal diameter of III antennal segment; eighth tergite with two long hairs with acute apices, about 2·4–2·8 times as long as the mentioned diameter. Antennae six jointed, flagellum gradually more distinctly imbricated from base to apex, excepting basal $\frac{1}{5}$ of III, which is almost smooth; processus terminalis, 1·6–1·7 times as long as the base of VI, about 0·74–0·76 times as long as segment III. Hairs on the antennae of variable lengths, longer ones with acuminate or acute apices, shorter ones with acute apices; longest hair on segment III, 2·1–2·3 times as long as the basal diameter of this segment. Rostrum reaching middle of the body; segments IV+V slender, acute, about 2·2–2·3 times as long as second

joint of hind tarsi; segment IV, 5·8–6·6 times as long as the segment V (Fig. 15), with about 8–12 hairs. Siphunculi pale, $\frac{2}{5}$–$\frac{1}{3}$ the length of the body (Fig. 16), 6·6–7·2 times as long as their maximum width; at base 2–2·2

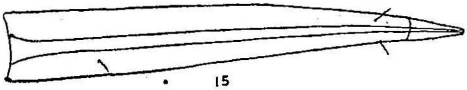


FIG. 15. *Paratrichosiphum* sp.: Rostral segments IV+V. × 235.

times as thick as the middle of the hind tibia, at middle 2·8 times as thick as the middle of hind tibia, and at apex 1·1–1·5 times as thick as the middle of hind tibia; hairs on the siphunculi numerous, very long and rather short hairs occur intermingled basad, those apicad of uniform length; rather short hairs with acuminate or acute apices, the longer ones mostly with acute

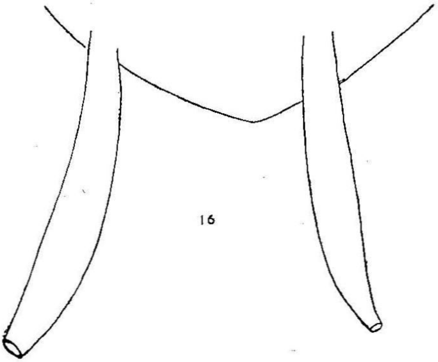


FIG. 16. *Paratrichosiphum* sp.: Siphunculi (without hairs). × 69.

apices, while a few towards the base with slightly acuminate apices; longest hair may be up to 2·1–2·3 times as long as the basal diameter of the siphunculi; spinules present over the entire length, densest on apical $\frac{1}{6}$ part. Cauda semi-oval with 8–10 long, fine hairs. Femora smooth, with spinulose striae on the ventral side on apical half. Tibiae smooth.

Measurement of one specimen in mm.:

Length of the body	..	1·9	Antennal segments:
Breadth ,, ,, ,,	..	0·82	III : IV : V : VI—0·33 : 0·13 : 0·23 : (0·16+ 0·25)
Antenna	..	1·2	
Length of the siphunculus	..	0·79	

Locality and host plant: Khasya and Jayantia Hills (12.6.61) from Rhododendron sp.

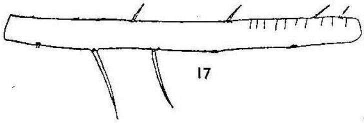
Total number of specimens: 4 alate nymphs.

These insects were all collected from the undersurface of leaves of the host plant. The specific identification will be possible only when the adult materials will be available.

(10) *Paratrichosiphum tattakanum* (Takahashi) nov. subspec. *assamensis.*

Takahashi, R. (1931). Aphididae of Formosa, Pt. 6, p. 31.

The subspecies agrees in most of the characters with *P. tattakanum* Takahashi, but differs from it in having a much shorter processus terminalis (1·2 to 1·3 times as long as the base of the segment), a much longer fourth segment of the rostrum (5 5 to 7·8 times as long as the V segment) and a much slenderer siphunculi (3·1 to 4·4 times as long as their maximum widths) besides, the venter of the abdomen is not evenly spinulose as in the original species (Figs. 17, 18, 19, 20, 21).



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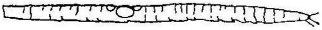

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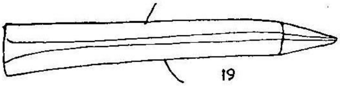
FIG. 17. *Paratrichosiphum tattakanum* (Takahashi) nov. subspec. *assamensis*: III antennal segment. × 117·5.
FIG. 18. *P. tattakanum* (Tak.) nov. subspec. *assamensis*: VI antennal segment. × 117·5.



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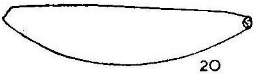

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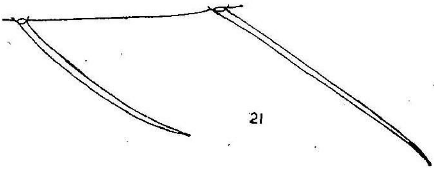

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FIG. 19. *P. tattakanum* (Tak.) nov. subspec. *assamensis*: Rostral segments 4+5. × 235.
FIG. 20. *P. tattakanum* (Tak.) nov. subspec. *assamensis*: Siphunculus. × 69.
FIG. 21. *P. tattakanum* (Tak.) nov. subspec. *assamensis*: Hairs on siphunculus. × 235.

Measurement of one specimen in mm.:

Length of the body	..	2·2	Antennal segments:
Breadth ,, ,, ,,	..	0·84	III : IV : V : VI—0·35 :
	..		0·15 : 0·19 : (0·15+0·20)
Antenna	..	1·20	
Length of the siphunculus	..	0·58	

Locality and host plant: Khasya and Jayantia Hills (7.6.61) from *Quercus* sp.

Total number of specimens: 8 apterae.

The specimens were seen to infest young leaves of the host plant, especially the undersurfaces.

ACKNOWLEDGEMENTS

The authors are thankful to Prof. J. L. Bhaduri, Head of the Department of Zoology, Calcutta University, for laboratory facilities, to Dr. V. F. Eastop, British Museum (Nat. Hist.), London, for helping in identification of

some of the species, and to the Superintendent, Indian Botanic Garden, Sibpur, for identifying a few host plants.

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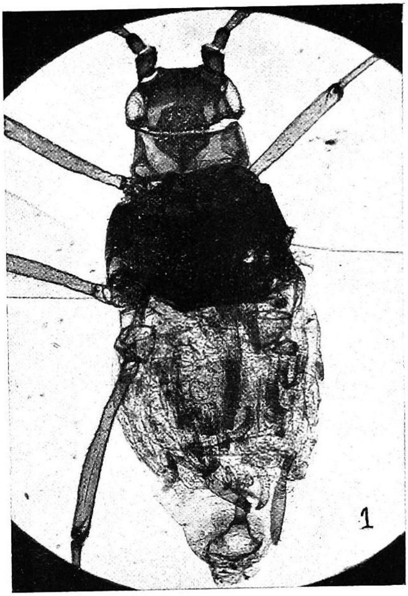

FIG. 1. *Chaetomyzus rhododendri* nov. spec.: Alate viviparous female. ×38·7.

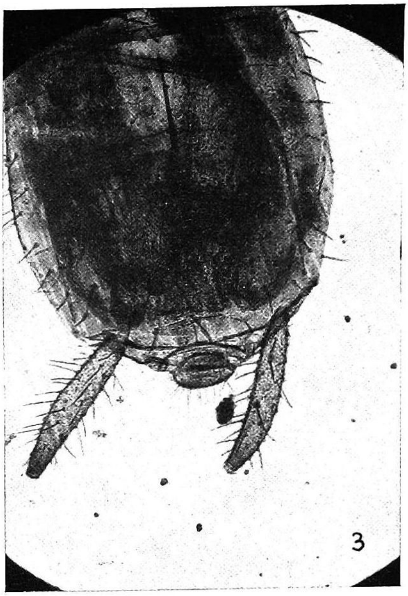

FIG. 3. *Neoparatrichosiphum khasyanum* nov. spec.: Hairs on siphunculi. ×38·7.

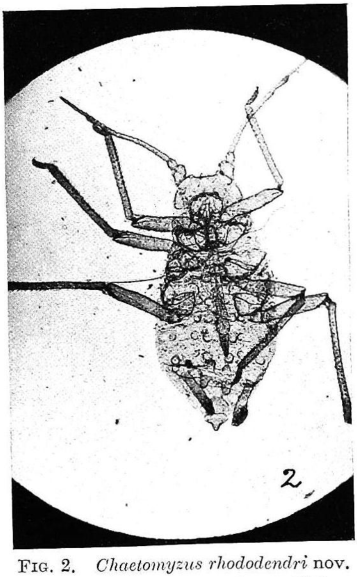

FIG. 2. *Chaetomyzus rhododendri* nov. spec.: Apterous nymph. ×29·2.

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THE STONE OF SANGGURAN (MINTO-STONE), JAVA, 850 ŚAKA

By Himansu Bhusan Sarkar

The findspot of this colossal stone inscription is not known. Most probably it was found from Ngendat in the north-west of Malang.[1] So far as our present informations go, it was received from Surabaya. Now it stands at the Minto House in Scotland, and was mentioned by Raffles in his *History of Java*, II, p. 59, with a 'mysterious translation' in the Appendix. Von Humboldt in his *Kawi sprache*, II, pl. XI, gave a facsimile of a part of the inscription which was transcribed by Cohen Stuart in his *KO* under No. XXIX. The legible portion of the full inscription has, however, been published in *OJO* where it bears No. XXXI. In 1915, Prof. Kern[2] offered a translation of the opening Sanskrit verses of this inscription, and later on Prof. Krom suggested some improvement in the reading of the text in some of his writings. I offer below a fresh edition of the text accompanied by translation, notes, etc. Cohen Stuart[3] mentions that the stone measures 5 ft. 3-4 inches in height; 4 ft. 1 inch in breadth; and 1 foot 1 inch in thickness.[4]

The inscription, written in Old-Javanese language, records the favour of the illustrious great king, *rakai* Pangkaja *dyah* Vava śrī Vijayalokanāmottungga, to the village of Sangguran under Vaharu which was marked out into a freehold for the deity (bhaṭāra) of the *kabhaktyan*-temple in the freehold of the united body of the *Juru gusali*(s) of Manañjung. In Old-Javanese inscriptions, temples of various kinds have been mentioned, for example, *dharma prāsāda* in copperplates of Kañcana (*VG*, VII, p. 17 f.), *parhyangan* in the copperplates of Ra Tavun I (*KO*, XIV), stone of Kayu Ara Hivang (*OJO*, XXII), *dharma pangasthulan* in copperplates of Copenhagen (*OJO*, XXIV), *Prasada* in the copperplates of Mamali (*BEFEO*, 47, p. 34), copperplate of Kvak (*OJO*, XII), etc. *Dharmas* are apparently funerary temples of deified beings; others relate to deities. The above-mentioned references have been quoted at random and can be easily multiplied.

In the following transcription, I have drawn upon the reading of Brandes with corrections suggested mainly by Prof. Krom. I have discussed in footnotes some proper names and other words which also occur in the records of contemporary Java. The śaka year of the inscription was read doubtfully by Brandes as 846, but Damais[5] reads it as 850. The exact date, according to him, is 2nd August, A.D. 928. The italics in the transcription indicate that the reading is provisional; illegible portion between words is indicated by vacant space.

Text

1. (|| 0 || avighnamastu)[6]*śivamas*tu sarvva jagataḥ parahitaniratah[7]-bhavāntu[8]bhuta(gan)āḥ[9]

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[1] Krom in *BKI*, 73 (1917), p. 30 ff.
[2] *BKI*, 70 (1915). It has been reprinted in Kern, *VG*, VII, pp. 223–226.
[3] *KO*, p. XVII.
[4] For earlier literature, see references in Verbeek, *Oudheden*, pp. 224–225.
[5] See *BEFEO*, 45 (1951), pp. 28–29; *ibid.*, 46 (1952), p. 56, f.n. 1.
[6] This is filled up with the help of *OJO*, XXX.
[7] Read: °tā(ḥ). [8] Read: °vantu. [9] This is filled up with the help of *OJO*, XXX.

2. *doṣa*[1]*praghātanāśāt*[2] sarvvatra sukhī bhavatu lokaḥ (|| 0 ||)[3].
3. svasti śakavarṣātīta 850 śravaṇamāsa[4] tithi caturdaśi[5] śuklapakṣa, vu, ka, śa, vāra, hastānakṣatra, viṣṇu devatā, so*bhagya*[6]
4. *yoga, irika divasa nī ājñā* śrī mahārāja rakai pangkaja[7] dyah vava śrī vijayalokanāmottungga[8]tinaḍah rakryān, mapatiḥ i hino
5. *śrī īśāna*vikrama, *umingsor i samgat* momahumah kāliḥ maḍaṇḍĕr pu padma, anggĕhan pu kuṇḍala kumonakan ikanang | vanua
6. i sangguran vatĕk vaharu, gavai[9] han tapak mas *su* halīmān susukan de nīkanang punta i manañjung mangaran ḍang āryya |
7. *kya, mamang* *yanggu* i, *sĕpĕt ḍapu* jambang, kisik (kĕ ?) *ḍapu* bhairava, vasya, luking, bhaṇḍa, tamblang, ha *ang, vigĕr, ḍapu sat* |
8. *sari s, a* ( )*i* bhaṭāra i sang hyang prāsāda kabhaktyan ing sīma kajuru gusalyan i mana*ñjung* paknānya *sīmangun pa* |
9. *umangakṣa* *ing samadanā* i sang hyang dharmma *ngkānani* śiva caturnivedya[10] i bhaṭāra pratidina mangkana iṣṭa prayojana śrī mahā |
10. *rāja muang rakryān* mapatiḥ rikanang vanua i sangguran inarpaṇnākan[11] i bhaṭāra i sang hyang prāsāda kabhaktyan ing sīma kajuru gusalyan ing manañjung |
11. *mā i vaharu parṇnaḥanya svatan*tra tan katamāna dening patiḥ vahuta muang saprakāra ning mangilala dravya haji ing dangū,[12] miśra paramiśra vuluvulu |
12. *prakāra, pangurang* kring, paḍam, manimpiki, paranakan, limus galuh, pangaruhan, taji, vatu tajam, sukun, halu varak, *raka*dut |
13. *pinilai katanggaran*, tapahaji, air haji, malandang, lĕva,[13] lĕblab, kalangkang, kutak, tangkil, trĕpan, salvit, tuha dagang, juru gusali, |
14. *tuhānamvi, tuhan uñjaman*, tuhān juḍi, juru jalir, pamaṇikan, miśra hino, vli hapu ; vli vadung, vli tambang, vli pañjut, vli harĕng, pavisar, palamak, |
15. *pakalangkang, urutan ḍampulan*, tpung kavung, sungsung pangurang, pasuk alas, payungan, sipat vilut pānginangin, pamāvaśya, pulung pa |
16. *ḍi, skar tahun, panrāngan, panusuh, hopan*, sambal sumbul, hulun haji pamrĕsi vatak i jro ityaivamādi tan tamā irikanang va |
17. *nua śima i sangguran kevala* bhaṭāra i sang hyang prāsāda kabhaktyan ing sīma kajuru gusalyan i manañjung, atah pramāṇa i sadrĕvya hajinya kabaih |
18. *samangkana ikanang sukha dukha* kadyānggāning mayang tan pavvah, valū rumambat ing natar, vipati vangkai kābunān, rāh kasavur ing da

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[1] Read : °ṣāḥ.
[2] Read : prayāntu nāśa(ṃ).
[3] The verse is written in the Āryā metre.
[4] The correct Skt. form is : śrā°.
[5] The correct Skt. form is : caturdaśī.
[6] The corresponding Skt. form is : saubhā°.
[7] Brandes read (*pha*)ng°, but see Krom, *Geschiedenis*,[2] p. 199.
[8] Brandes read °mo*stu*°, but see Krom, *op. cit.*
[9] For this reading, see Krom, *op. cit.*, p. 201, f.n. 4.
[10] Read : °nai°.
[11] Here also the consonant has been duplicated.
[12] Elsewhere, ring dangū.
[13] lĕca ?

19. *lan, vak capalā*, duhila*tan*, hidu kasirat, hasta capalā mamijilakan turuh ning kikir, mamuk mamumpang, lūdan, tūta |
20. n, ḍaṇḍa kuḍaṇḍa, *bhaṇḍihalādi*, bhaṭāra i sang hyang prāsāda kabhaktyan atah parāna ni dravya hajinya, kunang ikanang miśra, mañambul |
21. *mañang*vring *manglāka*, manguvar, matarub, mangapus, manula vungkuḍu, manggula, mangdyun, manghapu, mamubut, malurung, magavai |
22. *runggi*,[1] *payung vlū mo*( )*yi*,[2] *a*( )*jang*,[3] magavai *kisī* manganamanam, manavang, ma*na*(*ng*)*kĕb*, mamisaṇḍung man k, makalakalā |
23. *u*( )*u*[4]*tri*(*bhāgā*)*n*[5] *dravya hajinya, saḍuman umarā i bhaṭ*āra, sadūman umarā i sang makmitan sīma, sadūman maparaha i sang mangilala dravya haji |
24. *kapva ikanang ma*sambyavahāra *ngkāna* ( ) *i* ( ) *hingan*[6] *kveh*anya *anung* tan kna de sang mangilala dravya haji, tlung tuhān ing sasambyavahāra ing sasi | (ma)
25. *yan pangulang kbo* 40 , *vḍus* 80 *aṇḍah* savantayan, ma*ngu*langan tlung pasang, mangarah tlung lumpang, paṇḍai sobuban, (°vuv° ?), paḍahi tlung tang |
26. *kĕban titih saka*( )*ti*, *ṇḍa havi sa*tuhān, macadar patang pacadaran,[7] *parahu* 1 ma( )uhara[8]( )[9] tanpatuṇḍāna, yāpvan pinikul dagangnya ka |
27. *d*.*hyanggā*[10]*ning ma*[11] *manguñjal, mangavari*, kapas, vungkuḍu, *vsi*, tambaga, gangsa, *viṣā*,[12] *pangat*[13] pama*ja*, vayang, lnga, bras, galu[14] |
28. *han, kasumba, saprakāra ning*, *t sinĕmbal*[15]*kalima va*ntal ing satuhān. pikulpikulananya ing sasima (i)kanang samangkana tan knāna de sang mangilala |
29. dravya haji, *nya sa*( )*śanya*,[16] *ndān makmitana* tulis. mangka i lvīranya, yāpwan lbih sangkā rikanang *sapanghing* iriyang, knāna *śūta*[17]lbihnya de sang mangilala |
30. irikanang kāla mangasĕākan *ing* kanang[18] punta i *ma*nañjung pasak pasak. i śrī mahārāja pirak kā l vḍihan. ta |

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[1] Read: °ki.
[2] In some inscriptions, we find here: *mopih*.
[3] This appears to be a misreading for *a*(*ma*)*hang*.
[4] In other inscriptions, we find here: *kapua ya*.
[5] Filled up with the help of other inscription, e.g. the *Vanagiri inscription* in *TBG*, 74, p. 288.
[6] In an inscription of Balitung, we find here: hanangkāna hinghingana. See *Aanw. Kol. Inst.*, 1934, Bijl. A.
[7] Brandes misread the text as: ma*va*dar palang pavadaran. The above reading is supported by many records. The palang of Brandes is evidently a printing mistake.
[8] Read: ma(s)u(ng)hara.
[9] Usually we find here the numeral 3.
[10] Read: dya°.
[11] We usually find here mabasana.
[12] Here might have stood timā(ḥ) or wĕas which we have in other inscriptions.
[13] This appears to be a misreading for paḍat.
[14] This appears to be a mistake for gula. See *Singasari inscription* in *TBG*, 65, p. 237.
[15] In other inscriptions (*TBG*, 65, p. 237; 74, p. 288; *Aanw.*, *op. cit.*, p. 137), we read (*after* saprakāra ning): dual pinikul kalima . . . We have doubtless to read this in the text.
[16] In *OJO*, XXX, we read (*after* mangilala drabya haji): saparānanya sadeśanya, and this should fill up the above blanks.
[17] In other records we find here: ikana.
[18] Read: ikanang.

31. *pis yu* 1 *ra*kryān *ma*patih i *hino* śrī īśānavikrama inangsĕan pasak pasak pirak kā 1 vḍihan tapis yu 1 rakai sirikan pu amarendra[1] |
32. *lyang*[2] *samgat momahumah kālih* maḍaṇḍĕr, anggĕhan inangsĕan pasak pasak pirak kā 5 vḍihan yu 1 sovang sovang
33. tiruan ḍapunta taritip amrati[3] havang vicakṣana[4] pulu vatu[5] pu paṇḍamuan, halaran pu guṇottama, manghuri pu manguvil vadihati |
34. pu dinakara,[6] *hujung* inangsĕān pasak pasak pirak dhā 1 ma 5 vḍihan yu 1 sovang, vaharu rikang kālang pu variga inangsĕ |
35. *ān pasakpasak pirak* *vḍihan yu l samgat* anakbi dhā 7 mā 8 kain vlah 1 sang tuhān i vaharu vinaih pasakpasak |
36. *pirak dhā 8* *tuhān* i vadihati *pu* miramirah *halapa*[7] sang saddhya *tuhān* i makudur |
37. *i*[8] vadihati sang *ravangu*,[9] *manangga*[10] sang *hovangśa*, *pangurang i makudur* sang rakvĕl,[11] ma*nungkul*[12]
38. *pirak pasakpasak* vḍihan *ranya*

VERSO

1.
2.
3. *mpung*, vinaih pasakpasak mā 1 vḍihan yu 1 sovang sovang, sang tuhān *i pakaraṇān* makabaihan juru *kanayakān* |
4. i hino samgat guṇ*ungan pu* buntut,[13] juru vadvā[14] rarai, sang *ragu*yu, juru kalula pu vali,[15] kaṇḍamuhi *sang gaṣṭa*,[16] parujar *i siri*
5. kan[17]hujung galuh i vka vir*idih*, i kanuruhan *sa* ( )*kat*,[18] i sḍa sang vipala, i vavang sang lang, i ma*ḍaṇḍĕr* sang *cakrāryyāng-gĕhan*[19]*sang tu*[20] |

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[1] Brandes doubtfully read *manira*. For the above correction, see *TBG*, 55, p. 591; *OV*, 1919, pp. 66–67; Krom, *Geschiedenis*,[2] p. 202, f.n. 2.

[2] We can read the name as rakai wka dyaḥ balyang with the help of *OJO*, XXXIV (before 851 Śaka).

[3] For this filling up of the blank, compare *OJO*, XXXVII: v°. 4; Krom, *Geschiedenis*, p. 202, f.n. 2.

[4] Brandes doubtfully read viv*añcaṇa*, but the above correction is suggested by *OJO*, XXXVII (851 Śaka).

[5] Brandes doubtfully read *pa*lu vatu, but the above reading is given in *OJO*, XXXVII.

[6] Brandes doubtfully read *pu dara*, but it has been corrected as above by Krom. See also *OJO*, XXXVII.

[7] In *OJO*, XXXVIII (851 Śaka), we find here halang paluh.

[8] Before this word we have to read: pangurang.

[9] For this doubtful reading of Brandes, we have vungū in *OJO*, XXXVIII.

[10] *OJO*, XXXVIII, reads here: (m)anunggū.

[11] Brandes doubtfully read ra*ñjĕl*, but this is undoubtedly a misreading for the above. Compare *OJO*, XXXVIII, v°. 9.

[12] This appears to be a doubtful reading for *manunggū akul*(*umpang*). See *ibid.*

[13] Brandes read pu tuntu*n*, but the above name appears in *OJO*, XLIII: v°. 1 (852 Śaka). The confusion between *t* and *b* is possible.

[14] Brandes doubtfully read *pañca*, but the misreading appears evident from *OJO*, XLIII: v°. 1.

[15] In *OJO*, XLIII: v°. 1, his name appears as Bāla.

[16] In *OJO*, XLIII: v°. 1, his name appears as Geṣṭa.

[17] Brandes misread it as *si*( )ran, but the above correction may be supported by *KO*, 1: 1, 14; *OJO*, XXXVIII: v°. 11; XLIII, v°. 1–2.

[18] The name appears as Rokat in *OJO*, XXXVIII, v°. 11 and as Rakat in *OJO*, XLIII, v°. 2.

[19] From *OJO*, XXXVIII, v°. 12 and XLIII, v°. 2, the reading appears to be correct.

[20] In *OJO*, XXXVIII, v°. 12, his name appears as Vidya.

6. han i tiruan sumuḍan ḍapunta sanggama, i *hu*jung sang pava*d*ukan vinaih pasakpasak pirak *dh*ā 4 mā 8 kinabaihanya, sang citrā la[1] |
7. i hino pasak pasak dhā 3 mā 8 kinabai*hanya patih* kālih *vasah* sang kulumpang, kuci sang *rakavil* pasakpasak dhā 1 ma 4 sovang so |
8. vang, parujarnya pingsor hyang paskaran pasak pasak priak sovang sovang *lum*aku manusuk i vadihati *sang* kamala, *lum*aku manusuk i *makudur* sang tama |
9. *i* su han *sang* ngastuti sang *balā* (bapra ?), i tapahaji sang pa*c*intān vinaiḥ pasakpasak *dhā* 1 vḍihan yu 1 sovang sovang, patih i *kanuruhan ta*
10. patih i hujung sang kahyunan, patih vaharu sang nila, patih i tugaran sang mala, patih samgat i vaharu sang gambo, patih pangkur sang mangga sa(ng) rangga vinaih pasakpasak dhā 1 vḍi |
11. han yu 1 sovang sovang, patih lama ran sang prasama, pasakpasak pirak mā 8 vḍihan hlai 1 parujar patih si manohara *pasak pasak* dhā *1* vḍihan *yu 1* parujar patih i *ka* |
12. nuruhan si *ja* si rambĕt, parujar patih i vaharu si *val* si *tañjak* si caca, pasakpasak pirak mā 8 vḍihan hlai 1 sovang sovang, *vahuta* i vaharu si *ba* |
13. lu syag si *kĕ*ndul, tuha kalang, vinaih pasakpasak *dhā* 1 vḍihan yu 1 sovang sovang, pilunggah si rāji, si va*n*tan, piṇḍa *ti* vḍihan hlai 1 |
14. sovang sovang, rāma tpi siring milu pinakasākṣī ning manusuk sima i tugaran gusti si lakṣita, tuha kalang si yogya, vinaih pasakpasak pirak |
15. mā 8 vḍihan *yu* 1 sovang sovang, i kaja*tan* i pacangkuan si su*r*ā, i kḍikḍi si paha(ng ?) i *bu*ngkalingan si *tiñjo*, i kapatihan si pingul |
16. *i ḍa* si tambas vinaik[2] pasakpasak pirak mā 3 sovang sovang, *patih i* vungavunga pirak mā *ri pa*panahan vinkas si mangjavat, i *ka* *r*, *kulamati* si |
17. *k*aṇḍi i tampur si *deḍ*eran vinaih pasakpasak pirak mā ? sovang, si *mak* si kĕsĕk si *vuda*lū si kudi, matĕtĕ( )n si luluk vinaih pasakpasak pirak |
18. mā 4 vḍihan hlai 1 sovang, *ava*kol si lulut, si *sat*, si hirĕng, vinaih vḍihan hlai ? sovang, vayang si rahina pirak mā 4 vḍihan yu 1 sang boddhi, *sang mā*rgga, vi |
19. naih vḍihan yu 1 sovang, i tlas ning ma*v*aih pasakpasak muang vḍihan i sira kabaih pinarṇnah ikanang saji i sang makudur i sor ning vitāna, mangārgha ta sang pinakaviku |
20. sumangaskāra ikanang susuk muang kulumpang, manḍiri[3] ta sang makudur mangañjali i sang hyang tĕas malungguh i sor ning vitāna, mān dlan pāda, humarĕppakan[4] sang hyang tĕ |
21. as, masinghal vḍihan yu 1 tumūt sang vadihati, lumkas sang makudur manggayut[5] manĕtĕk gulū ning hayām, linanḍĕssakan[4] ing kulumpang mamantinga |
22. kan hantlū ing watu *si*ma mamangmang manapathe saminangmang nira dangū, i katguhakna sang hyang vatu sima, ikana līng nira, īndah ta kita kamung hyang i vaprakeśvara a |

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[1] Probably stands here: citralekha.
[2] Read: °naih.
[3] Read: mangḍ°.
[4] Here also the consonant has been doubled.
[5] Read: °uyut.

23. *ga*sti[1]mahārēṣi[2]pūrvva dakṣiṇa paścimottara maddhya[3] ūrddhamadhaḥ ravi śaśik[4]ṣitij alapa*t*ara,[5] hūtāśana[6] yajamānākāśa dharmma ahorātra sa |
24. *ndhyā hrēdaya,*[7] yakṣa rākṣasa pisāca[8] pretāsura garuḍa gandharvva catvāri lokapāla, yama varuṇa kuvera vāśava,[9] muang *p*atra[10]deva |
25. *ta*[11]*pañca* kuśika, nandīśvara, mahākāla ṣadvināyaka[12] nāgarāja durggā*devī*[13] caturāśra,[14] *ananta*[15] surendra ananta hyang kāla-mṛētyu[16] |
26. *gaṇa bhūta* kita prasiddha mangrakṣa kaḍatvan śrī mahārāja *i mḍang* i bhūmi matarām. kita umilu mararira[17]umasuk ing sarvva |
27. *sarīra,*[18]kita sakala sākṣī-bhūta tumon madoh lāvan mapare, ring rah*ina*, ring vngi at rēng kan.[19] ka ike samaya sapatha[20]sumpah pamangmang ma |
28. *mi ri kita hiyang*[21] kabaih, yāvat ikanang vang durācāra ta*n* *mā*gum-[22] tan makmit. irikeng sapatha[20]sinra*h*akan sang vah*u*ta hyang kudur, hadyan *hulun* matuha ra |
29. rai lakilaki vadwan, viku *gra*hastha muang patih vahuta rāma asing umulahulah ikeng vanua i sangguran, sima inarpaṇākan. nikanang punta i mana |
30. *ñjung* i bhaṭāra, i sang hyang prāsāda kabhaktyan ing sīma kajurugusalyan, i dlāha ni dlāha *vava* kataya *ngu*nivaih yan *da*vata[23]sang hyang vatu sīma ta*s*māt ka |
31. *bvat karma*knanya, patyanantā taya kamung hyang deyantat patīya, tattanolīha[24]i vuntat, ta(t)tinghala i likuran, *ta*(*r*)*ung* ingadē*gan* tampya |
32. 1. i virangan, tutuh tuṇḍunya vlah kapālanya, *sb*itakan. vtangnya rantannususnya[25]vtuakan ḍalmanya, ḍuḍuh.[26] hatīnya pangan dagingnya inum. rāhnya tēhēr pēpē |
33. *da*kan. vkas*a*kan. prāṇāntika, yan para ring alas panganan *ring* mong, *patuk* ning ulā pulīrakna ning devamanyu, yan para ring tgal. alappan[27]ning glap. sampalan ing rākṣasa, |

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1 Read: Agastya.
2 The correct Skt. form is: maharṣi.
3 The correct Skt. form is: madhya.
4 Read: śaśī. The reading of śaci by Brandes is evidently a printing mistake.
5 Read: °pavana.
6 Read: hu°.
7 The correct Skt. form is: hṛd°.
8 The correct Skt. form is: °śā°.
9 Read: °sa°.
10 Read: pu°.
11 Read: °tā.
12 Read: ṣaḍ°.
13 Read: °rgā°.
14 Caturāśrama ?
15 Here stands anakta in *KO*, VII: 6*a*.1.
16 The corresponding Skt. form is: mṛt°.
17 Read: manarīra.
18 Read: śa°.
19 Or: gökan.
20 Read: śa°.
21 Read: hya°.
22 Read: °gĕm ?
23 In a corresponding place of *OJO*, LXXXIII: 10*a*, we have (*pang*)*dahuta*.
24 Read: *ta tanolīha*. The last *t* in *tat* appears to be due to its contamination with the initial *t* of *tanolīha*.
25 Here also the consonant has been duplicated.
26 In some inscriptions, we find here *ḍuḍuk*.
27 Here also the consonant has been duplicated.

34. *dening vunggal* si pamungguan, *rĕngĕ*[1]ta kita kamung hyang kuśika gargga metrī kuruṣya pātāñjala,[2] suvuk lor suvuk kidul suvuk kuluan. vai |
35. tan, *bu*angakan ring ākāśa, salambitakan i hyang kabaih, tibākan ring mahāsamudra, klammakan[3]ing ḍavahan[4] alappan[3]sang *dalammer-*[3] *ḍū* |
36. *ḍutan i tangiran*[5]sanghapan ing vuhaya, ngkānan matya ikanang ngvang anyāya lumbur ikeng vanua sima i sangguran i sangguran upadravāng ri devatāg*rāṣṭa liputana* |
37. ḍira muliha *ring ka*naraka, tibākan ing mahārorava[6] klaṇ de sang yamabala, palun de sang kingkara, pipitva atayan bimbān *b*ā(pa)[7] ataya, sang |
38. lara sajīvakāla, salvir ning duhkha pangguhanya sa*rūpa* ning lara hiḍapannya makelik[8]ning ma*ng*śan[9] *k*adadyananya, avūya[10]tan. ta*mma*[11]angsāma *vtu*akan. havu kairir mangka |
39. nā tmahana nikanang ngvang anyāya *lum*h*ur*[12]*i*keng śīma i sangguran, i tlas *sang* makudur man*us*uk masal*inta* sira kabaih ta*mba* malungguh ing tkan pasak[13]*tumūt* krama sa(sang ?) |
40. *hana ning* kai[14]patiḥ vahuta rāma kabayan muang rāma tpi siring kabaih, matuha manvam lakilaki vadvan kaniṣṭhamaddhyamotama,[15] tanpānakantan,[16] umīlu manaḍah ring pa |
41. *glaran* ki n gu n inangsĕan[17]skul dākdannan linirusan[18]klakla ambilambil, kasyan litlit tlas aranak sangasangān āryya rumbaru |
42. *mba*(*h* ?) *k*ulangan[19]tetis[20]tumpuktumpu*k* *hasin* bilunglung kaḍivas h*u*rang k*ayan*[21] layalayar[22] halahala han vigang i *jaring*[23] |
43. *piṇḍa* ata*tmi*pihan, piṇḍa *gangan* ing n n pra*kāra* anaḍah ta sira kabaih, yathā[24] *o* manginum. siddhu,[25] ciñca kila |

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[1] Or : °gö.
[2] Read: garga maitrī kuruṣya patañjala.
[3] Here also the consonant has been duplicated.
[4] Read: °vu°.
[5] Elsewhere: tangh°.
[6] The correct Skt. form is: °rau°.
[7] This is filled up with the help of *OJO*, XXX, first margin, 26.
[8] Brandes doubtfully read °lit, but the above reading is supported by *OJO*, XXX, first margin, 2, and *OJO*, XLVIII, v°. 37.
[9] From *OJO*, XLVIII, v°. 37, the proper reading appears to be: mangjanma.
[10] Read: °vūka°; compare *ibid.*
[11] Read: tĕmua; compare *ibid.*
[12] Usually we find at this place *umulahulah* or *lbura.*
[13] Brandes doubtfully read *parek,* but the above reading is supported by *OJO*, XLVIII, v°. 40.
[14] In *OJO*, XLVIII, v°. 40, we read: krama sang hanarikān, etc.
[15] Read: °motta°.
[16] In *OJO*, XLVIII, v°. 41, we read here: tan hana kantun.
[17] We read paglaran ing pkan tinurĕn kunarĕn (pgan) inangsĕan in *ibid.*
[18] This reading is given in *ibid.* Brandes doubtfully read *ḍanḍananihiniru an.*
[19] In pl. III*a*: 20 of the Kĕmbang Arum inscription (*OV*, 1925, Bijl. B) and in *OJO*, XLVIII, v°. 42, we find at this place: kuluban.
[20] Brandes doubtfully read *tetil*(ā ?). For the above correction, see *ibid.*
[21] Perhaps we have to read here Kavan, which we find in *OJO*, XLVIII, v°. 43.
[22] We find layarlayar in the Kĕmbang Arum inscription, pl. III*a*: 19.
[23] *OJO*, XLVIII, v°. 43, reads here: hantiga inarisun( )a, etc.
[24] Brandes doubtfully read the word as ya*j*ā, but the above reading is given in *OJO*, XLVIII, v°. 44. From this word up to l. 5 below, the present record is almost identical with *OJO*, XLVIII, v°. 44–47.
[25] Read: sīdhu.

44. *tiga sovang*, *vinuvuhan* tambal[1]ī
dvadval, ka*pva* ma*n*alarmalari
taju,[2] skar |
45. *ka*baih *ti pramu*
śrī mahārāja, muang rakryān
di *i* manambah mangi |

Margin

1. (rāvaṇa)hasta sampun sang*kapa* ika |
2. *lekan*[3]lungguh *muvah pira* |
3. *ta*mbal[4]*lin*arīhan |
4. m t bang lū linarīhan v |
5. matlasan sira kabaih ka *muki* , i |
6. suma , ika*h*lammanya gumanti ika |
7. i sangguran. ikanang pu*nta i manañ-*
jung |
8. lāvạn *samyo*pāra ikanang *susukan* |
9. i vinaih manaḍaha, ikanang ma*ba* o |
10. si luhut si spat si hira *kapva* |
11. *nto*nakan guṇanya, irikanang
12. ta sira vayang mangaran
13. *han* krama nikanang susukan sīma *i sa*
14. *ngguran*, sa*mp*un samprayukta, likhita
15. citralekha i hino lakṣaṇa.

Translation

Recto

1. (||0|| Let there be no obstacles!) Let there be welfare for all the worlds! Let all beings be devoted to the good of others!
2. Let (all) stains be destroyed! Let the world be happy in all places!
3. Hail! The Śaka Year expired, 850, the month of Śrāvaṇa, fourteenth day of the bright half of the month, *vurukung*,[5] *kalivon*,[6] Saturday, (while) the lunar mansion Hastā (stood under) the deity Viṣṇu (during) the conjunction of Saubhāgya.
4. On this day, the command of the illustrious great king, the *raka* of Pangkaja,[7] *dyah* Vava,[8] H.M. Vijayalokanāmottungga, was received by the *rakryān mapatiḥ* of Hino . . .
5. . . . the illustrious Īśānavikrama,[9] and communicated to both the *samgat momahumah*(s): the *maḍanḍĕr*[10] (viz.) *Pu* Padma (and) the *anggĕhan* (viz.) *Pu* Kuṇḍala, ordaining that the village

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[1] Read: tāmbul.
[2] Read: jnu.
[3] This appears to be the remnant of *inigalakan*.
[4] Read: tāmbul.
[5] A Mal.-Polynesian day of the six-day week.
[6] A Mal.-Polynesian day of the five-day week.
[7] For the remarks of Stutterheim on this title, see *TBG*, 67, p. 198, and f.n. 65.
[8] In an inscription from the division of Kavi, *dyah* Vava is described as the *raka* of Sumba. See Kern, *VG*, VII, p. 180.
[9] He is evidently king Siṇḍok, successor to king Vava.
[10] Stutterheim (*TBG*, 65, p. 241, f.n. 59) thinks provisionally that *maḍanḍĕr* is connected with the donation of lands.

6. of Sangguran under Vaharu, *gavai* . . . *tapak* gold 8[1] *suvarṇa*, shall be marked out by the *punta* of Manañjung[2] named *ḍang āryya* |
7. . . . of Sĕpĕt, *ḍapu* Jambang (of?) Kisik, *ḍapu* Bhairava, Vasya, Luking, Bhaṇḍa, Tamblang . . . Vigĕr, *ḍapu* Sat |
8. . . . for the deity (*bhaṭāra*) of the sacred *prāsāda kabhaktyan*[3] in the freehold of the united body of the chiefs of smiths (*kajuru gusalyan*) at Manañjung. The object thereof is . . .
9. . . . to the sacred *dharmma*,[4] . . . to the place of Śiva (and) four kinds of offerings to the deity (*bhaṭāra*) in each day. Such is the beneficial object of the illustrious great king |
10. and the *rakryān mapatiḥ* with regard to the village of Sangguran which was given to the deity (*bhaṭāra*) of the sacred *prāsāda kabhaktyan* in the freehold of the united body of the chiefs of smiths at Manañjung | . . .
11. . . . in Vaharu. The position of it is that its freedom may not be interfered with by the *patiḥ*(s), *vahuta*(s) and all sorts of 'collectors of royal taxes' from earlier times,[5] miśra paramiśra,[6] all sorts of vuluvulu(s), |
12. pangurang,[7] kring,[8] paḍĕm,[9] manimpiki,[10] paranakan,[11] limus galuh,[12] pangaruhan,[13] taji,[14] vatu tajem,[15] sukun,[16] haluvarak,[17] rakadut,[18] |

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[1] This has been expressed in *candrasaṅkala*.

[2] This Manañjung-Vaharu is also met with in a fragmentary record from the Kaḍiri period. See *OV*, 1928, pp. 105–108.

[3] Temple for the united body of the devotees?

[4] Perhaps a temple has been intended hereby.

[5] Cf. Stutterheim in *TBG*, 65, p. 244, f.n. 70.

[6] Kern, *VG*, VII, p. 24, translates the term miśra paramiśra by 'great and petty usurers'! Stutterheim more plausibly suggests (*TBG*, 65, pp. 246-47) that this term was perhaps originally Indonesian and was sanskritized later on. He says that it may signify 'chief' and this interpretation remarkably agrees with the gloss on *miśra hino* and *miśra anginangin*. Whatever that may be, it is possible that *miśra paramiśra*, etc., has to be explained as 'all sorts of miśras (such as) *miśra hino, misra anginangin*', etc. This perhaps finds an analogy in such terms as *vuluvulu paravulu*, i.e. 'all sorts of *vulu*(s) or *paravulu*(s)'. It is noteworthy that in many inscriptions after the *vuluvulu* we find *prakāra*, i.e. 'all sorts of', and this signifies that, in some cases at least, the force of *para*= all sorts of. The function of these *miśra*-officers is, however, unknown to us.

[7] Kern translated this term by 'mendicant friar' in *VG*, VII, p. 47. Stutterheim plausibly suggests that the term may denote *tuhān*. See *TBG*, 65, p. 243, f.n. 68.

[8] Kern, *op. cit.*, pp. 24, 47, translates the term by 'decrepit'. According to Stutterheim (*op. cit.*, p. 246) it may be a title like *juru*, but its significance is not known (*TBG*, 75, p. 435).

[9] Their functions are unknown.

[10] Cabinet makers? See *KBWdb*, IV, p. 521; *TBG*, 65, p. 250.

[11] According to Kern, *op. cit.* 'cross-breed persons'. This interpretation does not appear satisfactory to me, as it does not suit the context in *OJO*, XXXVI: v. 1. For Stutterheim's notes, see *op. cit.*, pp. 247-48.

[12] Kern, *op. cit.*, translates the term by 'polisher of gems', Stutterheim (*op. cit.*, p. 248) by 'goldsmith'. See also *TBG*, 67, pp. 196-197.

[13] The significance of the term is not quite clear. Sometimes, the person holding this title appears to be connected with the avocations of a smith (cf. *TBG*, 65, p. 228, f.n. 31). According to Stutterheim, it may also be connected with the following word and accordingly translated as: makers of, workers of, etc. This is by no means certain, as words other than *taji* sometimes appear after *angaruhan*.

[14] Apparently a class of people or officers. According to Stutterheim, *op. cit.*, pp. 248-49: hen-track (Pangaruhan taji, hen-track makers?).

[15] Their functions are unknown.

[16] A class of quasi-doctors who invoke the aid of gods to cure various diseases? See Stutterheim, *op. cit.*, p. 249.

[17] The Bal: gloss has *juru pangajah* (pĕngajah= liable to service). See Stutterheim, *op. cit.*, p. 249. According to V. d. Tuuk (*KBWdb*, III, p. 715) the term denotes 'persons from the retinue of the king rendering services as director of the Orchestra, *vayang* and other entertainments'. See also the note of Kern, *VG*, VII, p. 47.

[18] Functions unknown.

13. pini(ng)lai,[1] Katanggaran,[2] tapa haji,[3] air haji,[4] malan-dang,[5] lĕva,[6] lĕblĕb,[7] Kalangkang,[8] kutak,[9] tangkil,[10] trĕpan,[11] salvit,[12] tuha dagang,[13] juru gusali,[14]
14. tuhānambi,[15] tuhān (h)uñjaman,[16] tuhān juḍi,[17] juru jalir,[18] pamaṇikan,[19] miśra hino,[20] vli hapu,[21] vli vadung,[22] vli tambang,[23] vli pañjut,[24] vli harĕng,[25] pavisar,[26] palamak,[27]
15. pakalangkang,[28] urutan,[29] ḍampulan,[30] tpung kavung,[31] sungsung

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1 Elsewhere: *viningle.* The Bal. gloss has *java gĕnḍing* (musician?). See Stutterheim, *op. cit.*

2 Cooks of rice. See Stutterheim, *op. cit.*, p. 250, and *TBG*, 75, p. 435.

3 The significance of the term is not clear, though it is most likely that the word *haji* has nothing to do with kings. As the term seems to be an exact equivalent of the Skt. *rājarṣi*, can it refer to a class of monks? Stutterheim in *TBG*, 65, pp. 250-51, thinks, however, that the reference to monks is not very probable and that it refers to a *juru* or a similar official title. His objection against monks is not so strong and this will appear from the association of the term with the following word and our notes thereon.

4 If a late work like *Nāg* (A.D. 1365) can throw light on this word, we can profitably study 75, 2 in it. We read there of a *mantri her haji* who is charged to look after Brāhmaṇical ascetics as a protector of hermits. As *mantri* may be synonymous with *juru* or chief, does not *her haji* imply a class of Brāhmaṇical ascetics? The association of *her haji* with *tapa haji*, therefore, acquires additional significance. The arrangement of titles in the official list is arbitrary in many cases, still it is noteworthy that these two terms generally go side by side and in *KO*, XVIII: 11, they are associated with *malarhyang* who is undoubtedly connected with religious institutions. For the view of Stutterheim, see *op. cit.*

5 Kern says (*op. cit.*) that the term may signify a class of assistants. According to V. d. Tuuk (*KBWdb*, IV, 584): 'Someone who institutes a gambling party or cock-fight and gains 10 p.c.' The term may be connected with the following word. See the note of Stutterheim, *op. cit.*, p. 251.

6 Elsewhere: lĕca. Apparently a class of people connected with cock-fight. According to Stutterheim the term may belong to the foregoing *malandang* whereof the primary significance is: to lead, to assist, etc.

7 Apparently a class of people. See Stutterheim, *op. cit.*, p. 252.

8 The term may refer to chiefs over little rice-barns.

9 Kukap? Its significance is not known to me.

10 The term may refer to a special class of servants under the king. See Kern, *op. cit.*, p. 47, Stutterheim, *op. cit.*, pp. 252-53.

11 Stutterheim in *TBG*, 65, p. 253, thinks that the word may be connected with *tirip.* Its primary significance is: to arrange, regulate.

12 Elsewhere: salyut? Persons of unknown functions.

13 Hawker.

14 Elsewhere: *tuha gosali* (*gusali*), the chief over smiths.

15 Doctor? Seeker of medicinal herbs? See Stutterheim, *op. cit.*, pp. 253-54.

16 Elsewhere: *juru huñjeman.* The significance of the term is not quite clear. See Stutterheim, *op. cit.*, p. 253, and *TBG*, 67, p. 175, f.n. 7.

17 Elsewhere: *juru juḍi.* It signifies the chief over gamblers. Stutterheim (*TBG*, 65, p. 258) quotes from Bastian's *Reisen in Siam*, p. 446: 'Some officers have control over game-houses.'

18 The chief over prostitutes.

19 Jeweller.

20 See note on *paramiśra.*

21 Dealers of lime.

22 Dealers of hatchets.

23 Dealers of brass.

24 Dealers of lights, luminaries, etc.

25 Dealers of charcoal.

26 Functions unknown.

27 Dealers of grease (?).

28 The term may refer to chiefs over little rice-barns.

29 The word may mean 'sausage', but this interpretation does not suit the context. Have we to understand the 'dealers of sausage'? See also Stutterheim, *op. cit.*, p. 259.

30 The word denotes a groom, but we have probably to seek here a different interpretation of the term, though we cannot suggest any. See also Stutterheim, *op. cit.*, p. 260.

31 Collectors of palm-leaves? Juynboll (*Lijst*, pp. 123, 246) interprets the term by copyists of palm-leaf MSS. See also Stutterheim, *op. cit.*, p. 260.

pangurang,[1] pasuk alas,[2] payungan,[3] sipat vilut,[4] pānginangin,[5] pamāvaśya,[6] pulung pa-
16. ḍi,[7] skar tahun,[8] panrāngan,[9] panusuh,[10] hopan,[11] sambal-sumbul,[12] hulun haji,[13] pamrĕsi,[14] vatĕk i jro,[15] and so forth. (These) may not tread upon the region
17. of the freehold at Sangguran. Only the deity (*bhaṭāra*) of the sacred *prāsāda kabhaktyan* in the freehold of the united body of the chiefs of smiths (*kajuru gusalyan*) at Manañjung is the sole authority over all royal things (of this place), |
18. evenso (over) the good and bad events (of this place) such as the *arĕca*-blossom that bears no fruit, the pumpkin that creeps along the ground, death, corpse bedewed, blood spilt on the
19. way, rashness in speech, sprinkled spittle that one must swallow, rashness with hands, uncovering of weapons from the sheath(?),[16] *amok*-making, molestation of women, *lūdan*(?), *tūtan* (?), |
20. all sorts of punishments for reviling, and so forth. The deity (*bhaṭāra*) of the sacred *prāsāda kabhaktyan* has the sole manorial rights over

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1 *Sungsung* is generally followed by Pangurang, but the words after pangurang are not always the same. Hence *sungsung pangurang* may be considered to be a self-standing word. Stutterheim (*op. cit.*, pp. 260-61) indeed says that the word *pangurang* occurring therein may be connected with the following word, but I consider that to be doubtful for the reasons stated above. The term may refer to the chief of messengers.

2 Elsewhere also: *pañjing alas.* The term may refer to the dwellers of a forest. In the stone of Kayumvungan 7(4)6 śaka and elsewhere we find a class of people called *tuha alas*.

3 The term may refer to the makers of umbrellas.

4 Apparently a class of people. For the view of Stutterheim see *op. cit.*, pp. 261-62.

5 His functions are not known. See Stutterheim in *TBG*, 65, p. 262.

6 Its significance is not clear. For various interpretations see Kern, *op. cit.*, p. 48, Stutterheim, *op. cit.*, pp. 263-64.

7 In Old-Javanese inscriptions, the words before and after *pulung paḍi* are not always the same and hence *pulung paḍi* should be considered to be a self-standing word. According to Kern (*op. cit.*, p. 48) the term denotes: binders of *paḍi*. *Pulung* is the basket of the rice-girls. See the note of Stutterheim, *op. cit.*, p. 261.

8 Lit.: 'Flowers of the year.' The term may therefore refer to the best harvest of the year (as tributes for the king). *cf.* Stutterheim, *op. cit.*, pp. 262-63, with literature cited therein.

9 The significance of the term is not clear. See, however, Hazeu in *TBG*, 46, p. 305 ff., and Stutterheim, *op. cit.*, p. 261.

10 Functions unknown.

11 Functions unknown.

12 The significance of *sambal-sumbul* is not quite clear. Kern, *op. cit.*, indeed said that the terms refer to persons who go about with sambal and with baskets of rice, but this interpretation has been contested by Stutterheim (*op. cit.*, pp. 265-66) who thinks that *sumbul* may refer to the chief of *Kuli*(s). Whatever that may be, Stutterheim takes *sambal-sumbul* to be a single word. We find, however, *samval* in *OJO*, XXIII: 7, and *TBG*, 67, p. 206, and no reference has been made to *sumbul*. It is not, therefore, impossible that the terms are distinct, though analogous like *kḍi valyan*. At present the question must be kept open.

13 According to Kern, *op. cit.*, p. 49: slaves maintained out of luxury. Stutterheim, *op. cit.*, p. 266, suggests: slaves coming to the king's possession out of misdeeds.

14 Elsewhere also: *pabṛsi*, *pamṛsi* or *mamṛsi*. According to Kern, *op. cit.*, the term denotes: cushion-carriers of the king. Stutterheim also (*op. cit.*, p. 266) thought that the term refers to a class of servants or slaves. He then seemed to favour its interpretation by: corpse-washers (?). See *TBG*, 75, p. 435.

15 The term may refer to: royal slaves of inner apartments. See the use of *vatĕk* in *KO*, XVIII: 14. Stutterheim has in *TBG*, 75, p. 435, translated the term by *kraton*-people. See also Kern, *op. cit.*, p. 49, *TBG*, 65, p. 267.

16 In the corresponding place of other inscriptions, we have *vuryya*, i.e. from behind.

(all) royal things (of this place). As regards the 'masters' (?)[1] making black paints, |

21. purple-red paints, lac, red paints (?), roofs, spinning (?), catching fish with (?) *vungkuḍu*, the making of sugar, pots, lime, bed-covers and pillows, repairing roads, the making of |

22. sheaths (?), the making of linen umbrella of different colours . . . the making of shuttle (?) for the spinning wheel, all sorts of wicker-works, fishing with a *tavang*-net (?), fishing with a *ta(ng)kĕb*-net, the ensnaring of birds (and) the trapping of beasts: |

23. (the profits of all) these may be divided into three parts (for) royal dues. (Hereof) one part goes to the deity (*bhaṭāra*), one part goes to the protector of the freehold (and) one part goes to the 'collectors of royal taxes'.

24. Similarly, the traders shall there be defined in their numbers: these may not be touched by the 'collectors of royal taxes'. (There are to be) three 'masters' for each trade per freehold. |

25. If (anything) is carried within (then are free) 40 buffaloes; . . . ; 80 goats; eggs, one cage; transport-carts, three teams; what is packed-up, three bundles; one bellow for smiths; three drums for *gamĕlan*-players, |

26. . . . each 'master'; *macadar*, four *pacadaran*(s); 1 vessel with (three ?) *sunghara*(s) without taking (any other boat) in tow. Even if their commodities are *pikuled*, |

27. for example, (the commodities) of the dealers who . . . come to hawk with art metal-works, cotton, *vungkuḍu*, iron, copper, brass, . . . *vayang*,[2] sesame oil, unbolstered uncooked rice, sugar, |

28. . . . *kasumba*, (then), of all the commodities which have been *pikuled* (is free) the fifth *vantal* for each 'master' of the *pikul* in each freehold. Such things may not be touched by the 'collectors of royal taxes', |

29. (even so, its manorial rights and jurisdiction); on the other hand, they should take care of the edict regarding all such things. If there is more than this defined limit, (then) from this, the surplus may be touched by the 'collectors of royal taxes'.

30. . . . At this time, the *punta* of Manañjung offered gifts in ample measure to the illustrious great king (viz.) silver 1 *kati* and |

31. *tapis*-cloth 1 set. The *rakryān mapatiḥ* of Hino (viz.) the illustrious Īśānavikrama received in ample measure silver 1 *kati* and *tapis*-cloth 1 set. The *raka* of Sirikan (viz.) *Pu* Amarendra, |

32. (the *raka* of vka, viz. *dyah* Ba-)lyang, both the *samgat momahumah*(s) (viz.) the *maḍaṇḍĕr* and the *anggĕhan* received, in ample measure, silver 5 *kati* and 1 set of cloth, each in particular.

33. The *tiruan* (viz.) *ḍapunta* Taritip, the *amrati* of Havang (viz.) Vicakṣaṇa, the *puluvatu*[3] (viz.) *Pu* Paṇḍamuan, the *halaran* (viz.) *Pu* Guṇottama, the *manghuri* (viz.) *Pu* Manguvil, the *vadihati* |

34. (viz.) *Pu* Dinakara, the *hujung*[4] (viz.) . . . received in ample measure

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[1] Cf. Stutterheim in *TBG*, 65, p. 273.

[2] Here the term should denote a kind of article.

[3] Or: (the *amrati* of) Puluvatu. A place of this name appears in the inscription of Kĕmbang Arum (*OV*, 1925, pp. 41–49), in an inscription of the time of king Vava (*OV*, 1928, pp. 66-67) and also in the *Jayapattra-Dieduksman* from 849 Śaka (*TBG*, 32, pp. 98–149).

[4] The title may be the same as *pihujung* found in the inscription of Kĕmbang Arum, pl. II: 11 (*OV*, 1925, *Bijl.* B.).

silver 1 *dharaṇa* 5 *māṣa* (and) 1 set of cloth, each. To the *kalang* of Vaharu (viz.) *Pu* Variga[1] was given |
35. in ample measure silver . . . cloth 1 set. The wife of the *samgat* (received) (silver) 7 *dharaṇa* 8 *māṣa* (and) 1 piece of skirt. *Sang tuhān* of Vaharu received in ample measure |
36. silver 8 *dharaṇa* . . . The (two) *tuhān*(s) of Vadihati: the *miramirah* (viz.) . . . *sang* Saddhya . . . (the two) *tuhān*(s) of Makudur . . .
37. . . . (the *pangurang*) of Vadihati (viz.) *sang* Ravangu,[2] the *manunggu*[2] (viz.) *sang* Hovangśa, the *pangurang* of Makudur (viz.) *sang* Rakvĕl, the . . |
38. . . . silver in ample measure (and) cloth .

VERSO

1.
2.
3. . . . received in ample measure (silver) 1 *māṣa* (and) cloth 1 set, each in particular. All the *tuhān*(s) of the judicial court (?), the *juru* of the united body of the *nāyaka*(s) |
4. of Hino, *samgat* Guṇungan (viz.) *Pu* Buntut, the *Juru* of *Vadvā rarai* (viz.) *sang* Raguyu, the *juru* of Kalula (viz.) *Pu* Vali, the *kaṇḍamuhi* (viz.) *sang* Gaṣṭa, the *parujar* of Sirikan (viz.)
5. the *hujung galuh*, (the *parujar*) of Vka (viz.) the *viridih*, (the *parujar*) of Kanuruhan (viz.) *sa(ng)* (Ro)kat, (the *parujar*) of Sḍa[3] (viz.) *sang* Vipala,[4] (the *parujar*) of Vavang (viz.) *sang* . . . , (the *parujar*) of Maḍaṇḍĕr (viz.) *sang* Cakra, (the *parujar*) of Anggĕhan (viz.) *sang* . . .
6. . . . (the *parujar*) of Tiruan (viz.) *Sumuḍan* (who is) *ḍapunta* Sanggama, (the *parujar*) of Hujung (viz.) *sang* Pavadukan, received in ample measure silver 4 *dharaṇa* 8 *māṣa*, all together. The designers |
7. to Hino (received) in ample measure (silver) 2 *dharaṇa* 8 *māṣa*, all together. Both the *patih*(s) (viz.) *sang* Kulumpang of Vasah[5] (and) *sang* Rakavil of Kuci[5] (received) in ample measure (silver) 1 *dharaṇa* 4 *māṣa*, each in particular. |
8. Their *parujar*(s) who present flowers (for religious matters) (received) in ample measure silver . . . each in particular. The *lumaku manusuk* of Wadihati (viz.) *sang* Kamala, the *lumaku manusuk* of Makudur (viz.) *sang*[6] . . . |
9. . . . . *sang* Ngastuti, *sang* Balā (Bapra ?), (the *lumaku manusuk* ?) of Tapahaji (viz.) *sang* Pacintān, received in ample measure (silver) 1

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1 The text of this portion is perplexing. Lit. it should be translated as *Vaharu* of the *kalang* (viz.) *Pu* Variga. But this interpretation is attended with some difficulties. Firstly, Vaharu as an official title demands caution of the reader, because the title is unusual in inscriptions. Besides, if it were a title we should expect the following word to be *i* and not *rikang*. Secondly, the use of *rikang* perhaps indicates, on the analogy of some other inscriptions, that in the following word *kala* and not *kalang* (an official title) has been intended. Thirdly, the use of *Pu* before Variga perhaps indicates that this should be a proper name and not a title. On the other hand, *Pu* appears to be used before *miramirah* in a following line and this is undoubtedly an official title. Fourthly, in a following line, we find the '*tuhān* of Vaharu'. This appears to be a good analogy in support of the above translation, though I consider it to be provisional.

2 See note on the text.

3 In *OJO*, XXXVIII, v°. 11, we find here: Sba(ng).

4 In *OJO*, XXXVIII, v°. 11, we find here: Vimala.

5 In this connection, see Stutterheim in *TBG*, 75, pp. 428, 436-37, and f.n. 1 on p. 437 and p. 455.

6 In *OJO*, XLIII, v. 4, his name appears as Ramangsa.

dharaṇa (and) cloth 1 set, each in particular. The *patih* of Kanuruhan . . .

10. the *patih* of Hujung (viz.) *sang* Kahyunan, the *patih* of Vaharu (viz.) *sang* Nila, the *patih* of Tugaran (viz.) *sang* . . . the *patih* of *samgat*(s) of Vaharu (viz.) *sang* Gambo, the *patih*(s) of Pangkur (viz.) *sang* Mangga (and) *sa*(*ng*) Rangga, received in ample measure (silver 1 *dharaṇa* (and) cloth |

11. 1 set, each in particular. The *patih* of . . . (viz.) *sang* Prasama (received) in ample measure silver 8 *māṣa* (and) 1 piece of cloth. The *parujar* of the *patih* (viz.) *Si* Manohara (received) in ample measure (silver) 1 *dharāṇa* (and) 1 set of cloth. The *parujar*(s) of the *patih* of |

12. Kanuruhan (viz.) *Si* . . . (and) *Si* Rambĕt, the *parujar*(s) of the *patih* of Vaharu (viz.) *Si* Val, *Si* Tañjak, *Si* Caca (received) in ample measure silver 8 *māṣa* (and) 1 piece of cloth, each in particular. The *Vahuta*(s) of Vaharu (viz.) *Si*

13. . . . *Si* Kĕndul, the *tuha kalang*, received in ample measure (silver) 1 *dharaṇa* (and) 1 set of cloth, each in particular. The *pilunggah*(s) (viz.) *Si* Rāji, *Si* Vantan, total . . . (received) 1 piece of cloth |

14. each in particular. The *rāma*(s) of neighbouring places who went to be witnesses in the marking out of the freehold: (the) *rāma*(s) of Tugaran, (to wit), the *gusti* (viz.) *Si* Lakṣita, the *tuha kalang* (viz.) *Si* Yogya, received in ample measure silver |

15. 8 *māṣa* (and) 1 set of cloth, each in particular; (the *rāma*) of Kajatan in Pacangkuan (viz.) *Si* Surā, (the *rāma*) of Kḍikḍi (viz.) *Si* Paha-(ng ?), (the *rāma*) of Bungkalingan (viz.) *Si* Tiñjo, (the *rāma*) of Kapatihan (viz.) *Si* Pingul, |

16. (the *rāma*) of . (viz.) *Si* Tambas received in ample measure silver 3 *māṣa*, each in particular. The *patih* of Vungavunga (received) silver of Papanahan, the *vinkas* (viz.) *Si* Mangjavat, . . . |

17. . . of Tampur (viz.) *Si* Dederan received in ample measure silver ? *māṣa*, each. *Si* Mak, *Si* Kĕsĕk, *Si* Vudalū, *Si* Kudi . . . *Si* Luluk received in ample measure silver |

18. 4 *māṣa* (and) 1 piece of cloth, each . . . *Si* Lulut, *Si* Sat, *Si* Hirĕng received ? piece of cloth, each. The *vayang*[1] (viz.) *Si* Rahina (received) silver 4 *māṣa* (and) 1 set of cloth. *Sang* Boddhi, *sang* Mārgga received

19. 1 set of cloth, each. After the completion of presenting different sums of money and clothes to all, the *saji*-offerings for *sang makudur* were laid out under the festal tent. The combined body of the *bhikṣu*(s) with offerings (in their hands) |

20. consecrated the foundation and the *Kulumpang*.[2] (Thereupon) stood up *sang makudur*. He folded palms of hands towards *sang hyang* Tĕas, sat under the festal tent, fixed his feet (and) faced *sang hyang* Tĕas |

21. with a skirt (and) one set of clothes. *Sang Vadihati* joined him. (Then) *sang makudur* (and) *manguyut*[3] began to separate the neck of the hen which was smashed on the *kulumpang*, threw down |

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[1] He may be a person showing shadow-plays. The line may also be translated as: the *vayang*-player of day-time.

[2] For an analogy, see the copperplate of king Vava in Kern, *VG*, VII, p. 182.

[3] The imprecatory formulae are usually uttered by the *makudur*. Here we find both the *makudur* and the *manguyut* in the same role. In *OJO*, CXII, 11*b*, we find simply the *manguyut* in uttering curses.

22\. the egg on the *watu sima*, uttered oaths and curses which were sworn in earlier times for the fixity of the *vatu sima*. The words of them were: 'Be gracious, you all deities of *Vaprakeśvara*(s), |

23\. the great seer Agastya, east, south, west, north, centre, zenith, netherworld, sun, moon, earth, water, wind, fire, the sacrificing host, ether, laws, day and night, twilight,

24\. heart, *yakṣa*(s), *rākṣasa*(s), *piśāca*(s), *preta*(s), *asura*(s), Garuḍa, *Gandharva*(s), the four guardians of quarters, Yama, Varuṇa, Kuvera, Vāsava, and the sons of deities, |

25\. the five Kuśikas, Nandisvara, Mahākāla, Ṣaḍvināyaka,[1] the king of serpents, Goddess Durgā, *Caturāśra*,[2] sons of the king of gods,[3] Ananta, the deities of Time and Death, |

26\. *Gaṇa*(s), *bhūta*(s) (and) you who are known to protect the *kraton* of the illustrious great king at Mḍang in the country of Matarām! You (spirits) who go to incarnate by penetrating into all |

27\. bodies, you (spirits) who see far and near, by day and by night! Listen to this utterance of oaths, swearings and curses of |

28\. mine to you, all gods! If any unrighteous person does not maintain and take care of the curses which have been uttered by *sang vahuta hyang* (and the?) *kudur*,[4] (be he) a nobleman (or) a slave, old (or) |

29\. young, man (or) woman, mendicant (or) a householder, and *patih*(s), *vahuta*(s), *rāma*(s)—whoever disturbs the village at Sangguran, a freehold that has been given by the *punta* of Manañjung |

30\. to the deity (*bhaṭāra*) of the sacred *prāsāda Kabhaktyan* in the freehold of the united body of the chiefs of smiths, for the remotest future, he may be brought to destruction! Moreover, when (he disturbs) the boundaries of *sang hyang vatu sima*, as the result of his |

31\. deeds, may he be killed by you! He may be killed by all gods in such a way that he may not (find time to) turn behind, he may not (find time to) look behind: he may be pushed on the front-side, struck |

32\. on the left side, his mouth may be struck, his forehead may be battered, his belly may be ripped open, his intestines may be rooted out, his entrails may be drawn out, his heart may be plucked out, his flesh may be eaten up, his blood may be drunk up, then he may be trampled |

33\. upon, lastly he may be killed. If he goes to the forest, he may be eaten up by the tiger, bitten by the snake (and) whirled round and round by the anger of gods! If he goes to the fields, he may be struck by lightning, torn into pieces by the *rākṣasa*(s), |

34\. . . .[5] Listen, you all gods (:) Kuśika, Garga, Maitrī Kuruṣya, Patañjala, guardians (?) of the north, guardians (?) of the south, guardians (?) of the west (and) |

35\. east! He may be thrown off from the firmament, he may be strangled (?) by all gods, he may be dashed into the great ocean, he may be dipped into the (waters of the) dam, he may be dragged into the depth of the water to be |

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[1] This is a name of Gaṇeśa. See Kern, *VG*, VI, p. 311.

[2] Probably the four *āśrama*(s) have been invoked here.

[3] Brandes doubtfully reads *ananta*, but as this has been repeated after the following word, it is possible that the word is *anakta*, as we have in *KO*, VII.

[4] That *vahuta hyang* is an officer under *makudur* appears from *OJO*, XII: A. 9-10. As *makudur* and *manguyut* are cursing together, can it be a fact that *vahuta hyang*=*manguyut*?

[5] Here might have stood: *panganĕn dening vuil*. If so, the translation of the whole passage should be: eaten up by the titan while he stands on.

36. torn into pieces by the *tanghiran* and caught by the crocodile! Thus dies the unrighteous person who destroys the region of the freehold at Sangguran under Sangguran. (Even if anybody) creates troubles for the deity . . . |

37. . . . he may turn towards hell and be thrown into the *mahārauravahel* to be cooked by the servants of Yama and struck by the servants of Yama! Seven times may be destroyed the images of his father . . . |

38. As long as he lives, he may have sorrows, he may experience all sorts of sorrows, he may suffer all sorts of sorrows! He may be abhorred . . . His position may be (such that) he may be furiously attacked without experiencing tranquillity . . . (his) ashes may be blown away.' Such |

39. is the fate of the unrighteous person who destroys the freehold of Sangguran after *sang makudur* marked out . . . all . . . sat after coming in loose batches; (then), according to rank,[1] all

40. the *patih*(s), *vahuta*(s,) *rama*(s), *kabayan*(s)[2] and all the *rama*(s) of neighbouring places, the old and the young, males and females, of the lowest, mediocre (and) highest position, without anybody remaining behind, went to take food in a circle, |

41. . . . received cooked rice. *Dākdannan*[3] (and) *linirusan*[3] were cooked with spices and were sufficiently taken in. Grain-powders (*litlit*) were much relished. After that (they ate) excellently roasted *aranak*[4] (and) cooked meat (?), kneaded

42. *tetis* (?), *tumpuktumpuk*, . . . salted . . . *bilunglung*-fish *kaḍivas*-fish . . . cray-fish, *layar-layar*, *hala-hala*, *vigang* . . .

43. . . . , and so forth. All of them ate these according to (their heart's desire). They drank rum (and) *ciñca*-wine . . . |

44. . . . betel-leaves were given in abundance . . . made toilette with flowers . . .

45. . . .

MARGIN

1–12. . . .[5]

13. (Such is) the procedure of marking out the freehold at Sangguran. |

14. Henceforward, (this is) permanently regulated. (This is) written by

15. the designer to Hino (viz.) Lakṣaṇa.

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[1] *tumūt krama* appears to be the same as (*sa*)*yathākrama* wherever Van Naerssen speaks in *BKI*, 90, pp. 247–248.

[2] Or : *rāma kabayan*(s).

[3] The words are not known to me.

[4] If we consider that the phrases *aranak* and *āryya* refer to children and adult people (or, noblemen), other interpretations may be possible, but some grammatical objections may also be raised.

[5] As the text is very mutilated, no decent translation is at all possible.

APPENDIX

A. *Abbreviations*

BEFEO .. Bulletin de l'Ecole Francaise d'Extreme—Orient.

BKI .. Bijdragen tot de Taal-Land en Volken kunde, uitgegeven door het Koninklijk Instituut voor Taal, Land-en Volkenkunde te 's—Gravenhage.

KBWdb .. Kawi-Balineesch-Nederlandsch woordenboek door H.N. van der Tuuk, 4 vols.

KO .. Kawi Oorkonden, Inleiding en Transcripties, door Dr. A. B. Cohen Stuart.

Lijst .. Oudjavaansch-Nederlandsche Woordenlijst door Dr. H. H. Juynboll.

OJO .. Oudjavaansche Oorkonden, Brandes-Krom, in Verhandelingen van het Bataviaasch Genootschap van Kunsten en Witenschappen, vol. 60, 1913.

OV .. Oudheidkundig Verslag, uitgegeven door (Koninklijk) Bataviaasch Genootschap van Kunsten en Wetenschappen.

TBG .. Tijdschrift voor Indische Taal, Land-en Volkenkunde, uitgegeven het (koninklijk) Bataviaasch Genootschap van Kunsten en Witenschappen.

VG .. Verspriede Geschriften door Dr. H. Kern.

B. *Official Titles and Honorifics*

Air haji
Anggĕhan
Amrati

Citralekha

Ḍampulam
Ḍang Ārya
Ḍapu
Dyah

Halaran
Halu Varak
Hopan
Hujung
Hujung Galuh
Hulun Haji

Juru
Juru gusali
Juru jalir

Kabayan
Kalang
Kajuru gusalyan
Kalangkang
Kaṇḍamuhi
Katanggaran
Kring
Kudur
Kutak

Lĕblĕb
Lĕva
Limus galuh
Lumaku manusuk

Madaṇḍĕr
Makudur
Malaṇḍang
Manghuri
Manguyut
Manimpiki
Manunggu
Mapatih i hino
Miramirah
Miśra
Miśra hino

Nayaka

Paḍĕm
Pakalangkang
Palamak
Pamanikan
Pamrĕsi
Pangaruhan
Panginangin
Pangurang
Panrangan
Panusuh
Paramiśra
Paranakan
Parujar
Pasuk alas
Pavisar
Payungan
Pilunggah
Pininglai
Pulung paḍi
Pulu Vatu
Punta

Rakadut
Rakai
Rakryan
Rama

Salvit
Sambal sumbul
Samgat
Samgat momahumah
Sĕkar tahun
Ṣipat vilut
Śrī mahārāja
Sukun
Sungsung pangurang

Taji
Tangkil
Tapa haji
Tĕpung kavung
Tiruan
Trĕpan
Tuha dagang

Tuha kalang
Tuhan
Tuhan ambi
Tuhan huñjaman
Tuhan juḍi
Urutan
Vadihati
Vahuta
Vahuta hyang

Vatak i jro
Vatu tajĕm
Vayang
Vinkas
Vulu Wulu
Vli hapu
Vli harĕng
Vli pañjut
Vli tambang
Vli wadung

C. *Philological Notes on Important Old-Javanese Words*

List has been drawn up according to the initial letter of the roots.

A

Alappan	< alap+an
Mangañjali	< mang+*Skt.* añjali
Mangar̊gha	< mang+*Skt.* arghya
Manganamanam	< mang+anam+anam
Umara	< Um+ara
Maparaha	< ma+pa+arah+a
Mangasĕakan	< mang+asĕ(h)+akan; *Modern Javanese and Mod. Sund.*: asih, sih
Inangsĕan	< in+ang+(a)sĕ(=sih)+an
Inarpannakan	< *Skt.* arpan+in+akan

B

Buangakan	< buang+akan; cf. *Mal.* boevang

G

Magavai	< ma+gavai

H

Humarĕppakan	< harĕp+um+akan

J

Kajuru gusalyan	< Ka+juru gusali+an

K

Kĕnana	< Kĕna+na–
Kumonakan	< Kon+um+akan
Makmitan	< ma+Kĕmit+an
Makabaihan	< ma+kabaih+an
Kinabaihan	< Kabai+in+an
Klammakan	< Kĕlam+akan; *Modern Javanese and Mod. Sund.*: Kĕlēm

L

Lumkas	< Lĕkas+um
Linandĕssakan	< Landĕs+in+akan
Salambitakan	< Sa+*Skt.* lambita+akan

M

Muliha	< Mulih+a

P

Prasada Kabhaktyan	< Pra° Ka+*Skt.* bhakti+an
Pinarnnah	< Parnah+in
Mamantingakan	< ma+panting+akan; *Modern Javanese*: Panting, manting

R

Mangraksa	< mang+*Skt.* rakṣa

S

Sanghapan	< Sanghap+an; *Sund.*: sanggap
Susukan	< Susuk+an
Sinĕmbal	< Sĕmbal+in
Pinakasākṣī	< Pa+in+ka+*Skt.* sākṣī
Manusuk	< Ma+susuk
Umingsor	< Um+ing+sor
Sumangskara	< Sangskara (*Skt.* Saṅskāra)+um
Manapatha	< ma+*Skt.* śapatha
Sinrahakan	< Srah+in+akan

T

Tibakan	< tiba+akan. Also *Sund.*: tiba
Tinaḍah	< taḍah+in
Katamana	< Ka+tama+na
Manavang	< ma+tavang
Mana(ng) kĕb	< ma+ta(ng)kĕb
Katenguhakna	< Ka+tenguh+aken+a

U

Upadravang	< *Skt.* upadrava+ng

V

Mamijilakan	< ma+vijil+akan
Vinaih	< vaih (veh)+in
Pinakaviku	< pa+in+ka+viku

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FOOD AND FEEDING HABITS OF *ANISOPS BOUVIERI* KIRK. (HETEROPTERA: NOTONECTIDAE)

By A. K. Gorai *and* D. N. Ray Chaudhuri

(Communicated by Prof. J. L. Bhaduri)

The water-bugs are notorious predators. Records from early date are replete with accounts of their voraciousness (Hungerford, 1919). Nearly all aquatic hemiptera are strict predators (Pennak, 1953). These bugs attack small fish, tadpoles, small frogs, etc. (Distant, 1906). Their normal food consists of planktonic organisms (Hungerford, 1933).

Preponderance of these insects in freshwater ponds and ditches of the district of Midnapore has been posing a problem to the pisciculturists as these bugs kill both fish food and fish-larvae, thereby causing a havoc to the fishery. Their harmfulness in relation to fishery has been reported by Alikunhi (1955), Hungerford (1919), Imms (1947), Khan and Hussain (1947), Maill (1912) and Wilson (1923). Literature dealing with this aspect is scanty in so far as India is concerned.

Abundance of *Anisops bouvieri* Kirk., in the bundh-type fish-breeding ponds in Midnapore, West Bengal, has led us to study its food and feeding habit.

During rainy season (June to August) different instars and adults of the insect were collected from a fish-breeding pond. The insects were then sorted out and kept separately in 24 vivaria, containing the pond water, in such a way that every four vivaria contained the same type of the insect. The water in each vivarium was at first filtered through a fine cotton cloth for segregating out the visible planktons. The filtered water was again used for culturing the insects. Planktons were then collected and sorted out into four types. These were added to the vivaria in such a way that the instars and adults of the insect were provided separately with a definite number of each type of planktonic food. This was done to note the food habit of the insects.

Each experimental set-up with the insects was continued for about a week. Every alternate day a fresh lot of the same type of food as before was added to each vivarium. The insect mortality in a vivarium after a week was considered as indicative of unsuitability of the food provided.

Separate experiments were carried on with fish-larvae and fingerlings which were collected from the same pond during the rainy season. The instars and adults of the insect were placed separately in 12 vivaria, and they were so arranged that each type of the instars of the insect was placed in two vivaria and the adults in the other two. One out of two vivaria was provided with fish-larvae and the other with fingerlings. The number of insects and fish-larvae (or fingerlings) in each vivarium was first noted and every 24 hours the number of fish-larvae (or fingerlings) that died was recorded, and the dead were replaced by a fresh living lot. Each set-up was continued for about a week and the insect mortality was considered as indicative of unsuitability of the given type of food.

The first experiment with planktonic food and larvae was conducted in 1959 and repeated in 1960 and 1961 to check up the results. Different ponds were selected every year to extend the observations.

The insect normally remains upside-down in water with the ventral surface parallel to the surface of water. The first and second legs are bent over the thorax, keeping the tibiae and tarsi parallel to the sternum which is flat, in such a way that a gap is maintained in between the bent legs and the sternum. Each tibia and tarsus are armed on both sides with long spines, all arranged in a single plane, and when bent over the sternum, the spines form a close-mesh net covering the gap from above. The space is thus transformed into a sort of a prison for its victim. The space has been named by Hungerford (1919, 1933 and 1956) in his insects as 'planktonic crib'. The spines on tibia and tarsus of earlier instars are more closely set than on those of the later instars and adults. The third pair of legs straighten out as swimming paddles and the insect can swim quickly forward or can move up and down, while the distal parts of its other legs are held at an angle to the body.

At the sight of any moving organism the insect darts at it, quickly throws its first pair of legs across the prey and the second pair of legs join the first on the sides. The legs instantaneously bend over the sternum and the prey is caught firmly in the 'crib'. Smaller organisms are often found escaping through the spinous net of the 'crib' of late instars and of adults, while those of earlier ones are capable of preventing such an escape.

While captive in the 'crib' the prey can be made to move to and fro by the movement of tibiae and tarsi and thus is brought close to the rostrum. The stylets which are then protruded from rostrum are noticed to touch at different points on the prey. The purpose of such touches by the rostrum is perhaps that the insect is seeking a suitable place for penetration of the stylets. Just after pricking, the prey, so long trying to escape, becomes motionless and paralysed. This is possibly due to injection of certain poisonous fluid from the rostrum (perhaps saliva) into the prey.

The insect can swim freely, carrying the prey in the 'crib' for several minutes, while it continues to suck the sap of the prey. One prey may be pricked at several points in order to draw in sufficient quantity of the sap. After suction is over, the dead prey is allowed to drop down by stretching the 'crib'-forming legs and the insect swims forward for another.

The planktonic organisms of the fish-breeding pond were sorted out into four major groups, viz. Copepods, Cladocerans, Ostracods and Nauplius larvae. All the four types were more or less represented in other ponds. The food habits of five instars and the adult insects in respect of planktonic food were noted (Table I).

From Table I it is noticed that Copepods and Cladocerans are used as food by the insect throughout its life history while Ostracods from the third instar onwards, but the Nauplius larvae are consumed only during the first three nymphal stages.

Fish-larvae and fingerlings collected from the pond represented *Catla catla*, *Labeo rohita*, *Cirrhina mrigala*; although minor carps were also represented in the collection. Food relationship between the insects and the fish-larvae, etc., was observed (Table II).

Table II reveals that the insect up to the fourth instar does not consume either fish-larvae or fingerlings at all as food. The adults are harmful both to fish-larvae and fingerlings, while the fifth instar only to the larvae.

As regards the rate of destruction, it was observed that an adult could destroy on an average one larva per hour and one fingerling every two hours, while a fifth instar could kill one fish-larva in every two hours.

The abdominal portion of the fish-larvae and fingerlings are chosen by the insect for penetration of the stylets. Usually after a full meal the insect lies motionless on the bottom for several minutes.

TABLE I

	Copepods	Cladocerans	Ostracods	Nauplius larvae
1st instar ..	+	+		+
2nd instar ..	+	+		+
3rd instar ..	+	+	+	+
4th instar ..	+	+	+	
5th instar ..	+	+	+	
Adult insect ..	+	+	+	

TABLE II

	INSTARS					Adult insect
	1st	2nd	3rd	4th	5th	
Fish-larvae ..					+	+
Fingerlings ..						+

Anterior pairs of legs forming the 'planktonic crib' are a characteristic feature as observed in other insects of this family by Hungerford (1919, 1933 and 1956) and Bare (1926 and 1928). Their normal posture of swimming upside-down has facilitated such modification in food-taking. Moreover, the hydrostatic balance exhibited by *Anisops bouvieri* and its ability to remain for some time under water are added advantages in capturing the prey. Similar characteristics has also been reported in *Anisops* sp. by Brooks (1951) and in the allied genus *Buenoa* by Bare (1928).

Planktonic organisms serving as food of water-bugs have also been observed by Hungerford (1919, 1933 and 1956), Bare (1928), Rawat (1939) and Brooks (1951). The present experiment shows that *A. bouvieri* is a ready plankton-feeder, Copepods and Cladocerans being the staple food throughout the life-cycle. The first and second instars do not prefer Ostracods perhaps because their stylets are not strong enough for penetration, while Nauplius larvae are observed to escape through the spinous net of the 'crib' from the fourth instar onwards. Since the earlier instars are armed with a more closely-set spinous net in the 'crib', the larvae are incapable to escape and fall ready victim. The third instar alone is capable of consuming all the types of planktons.

With regard to the fish food of the insect, it is noticed that earlier instars are not taking any fish-meal. This is presumably due to their incapability of capturing the larvae, etc., since the latter are much larger than these instars.

The salivary glands of the insect are possibly responsible for the secretion of poisonous fluid which renders the prey paralysed. Similar function of the salivary glands has been observed by Rankin (1935) in *Lethocerus americanus*, by Rawat (1939) in *Naucoris cimicoides* and by Sutton (1951) in Corixidae.

Since the insect consumes fish-larvae, etc., at some stage of its life-cycle, their predominance in a fish-breeding pond is undoubtedly a menace to the fishery. Various workers like Hungerford (1919 and 1956), Brooks (1951) and Alikunhi (1955) have expressed similar opinion with regard to water-bugs in inland waters. Moreover, breeding of the insect in a pond sets in a competition for food between the insects and the fish-larvae and fingerlings. The normal growth of the fishes consequently suffers at least to some extent. The cannibalistic habit among the insects may be regarded as a natural check on the insect population.

Many have pointed out that eradication of aquatic insects lies in the use of plankton nets or drag nets as suggested by Ganguly and Mitra (1961). But the use of planktonic nets means eradication of planktonic fauna as a whole, which fact is definitely detrimental to pisciculture. Moreover, the term 'drag net' is not very clear to us as the authors have not clearly expressed as to what they actually mean by the term 'drag net'. However, suitable artificial methods for removal of the insects should be found out for insuring fish-breeding.

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Summary

1. *Anisops bouvieri* Kirk. is found abundantly in the fish-breeding ponds in the district of Midnapore.

2. The spinous legs of the insect are bent over the sternum to form a 'planktonic crib' where prey is held for suction.

3. The insect is a ready plankton-feeder, consuming those that also serve as fish-food. Copepods and Cladocerans are attacked by all the instars and adults. Nauplius larvae are killed only by the earlier instars, while Ostracods by later instars and adults.

4. Fish-larvae and fingerlings of major carps fall ready victim to the adult insects, while the fifth stage among the instars is capable of killing the fish-larvae.

5. Food-competition among the insects and the fishes, and the former's killing habit cause considerable damage to the fishery; the elimination of the insects from the breeding ponds is therefore necessary.

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DOCUMENTS OF RĀṆĪ BHAVĀNĪ OF NĀṬOR

By D. C. SIRCAR

About the end of June, 1962, I happened to visit the gallery of the Directorate of Archaeology, Government of West Bengal, 33 Chittaranjan Avenue, Calcutta 12. My attention was there drawn to an exhibit which is a paper document bearing the signature of Rāṇī Bhavānī and addressed to Mahārājā Nandakumār, two of the most illustrious names in the modern history of Bengal. About five weeks later, I received a photograph of the record for study and publication from Shri P. C. Das Gupta, the Director, to whom I am thankful for the kindness.

The document is written in Bengali characters as prevalent about the eighteenth century, the language being Bengali which is, however, characterized by the use not only of a few passages in Sanskrit but also of a large number of words of Arabic and Persian origin. It is not very easy to read and interpret correctly records exhibiting such styles of writing and expression, especially in view of the fact that some of the foreign words are used in modified senses.

About the same time, my attention was also drawn to another document bearing the signature of Mahārāṇī Bhavānī, a photograph of which appeared in the Bengali weekly journal called *Desh* (i.e. *Deś*), dated the 30th June, 1962 (15th Āṣāḍh, 1369 B.S.), p. 883, as an illustration in an article entitled 'Rāṇī Bhavānīr Dalil' (A Document of Rāṇī Bhavānī) by Shri Chittapriya Mitra at pp. 883–87. In spite of the title of Mitra's article, it really contains very little about the record itself—neither its text nor any interpretation thereof. As regards the text, Mitra quotes only five words from the document, in which also there are errors of both reading and interpretation. But he has correctly read the date and the name of the addressee.

The records begin with the passage ইয়াদিকির্দ্দ which is modified from Persian *yād kund* or *yād bāīd kard* and means 'Be it remembered'. The language of the following section is seemingly Sanskrit, though it abounds in Bengali and Perso-Arabic passages. Often words of different origin have been joined in *samāsa* and *sandhi* as in করজপত্রমিদং (in which করজ from Arabic *qarz*, 'a loan', is joined in *samāsa* with Sanskrit *patram*, 'a deed') and কার্য্যঞ্চাগে (in which Sanskrit *kāryañ* = *ca* is joined in *sandhi* with আগে used in Bengali, etc., to mean 'ahead, below, afterwards', the word *kārya* indicating 'the object or subject-matter of a document'). The rest of the records is written in Bengali abounding in Arabic and Persian words used in some cases in modified senses, as indicated above. Thus শদর or সদর (from Arabic *ṣadr* generally meaning 'principal') has been used in the sense of 'current' with reference to a year, in one case with the Bengali locative suffix তে added to it. For the Bengali verb দিলাম (I am giving), Document I has দিলাম and দিল and Document II দিলাওঁ and দিল, the forms দিলাম and দিলাওঁ representing different pronunciations of the same word.

As regards orthography, the sibilants are often used indiscriminately without reference to the sound concerned as in দশ্তবদশ্ত for Persian দস্তবদস্ত (from hand to hand), শীক্কা for Arabic *sikkah* (a current coin), জিলিষ for Persian *jalūsī* (the year reckoned from the date of the king's accession),

হাশীল for Arabic *hāṣil* (revenue), খালিশা সরিফা for Arabic *khāliṣah sharīfa* (the royal exchequer, revenue department), সামিল for Arabic *shāmil* (included), সমশ in the geographical name সমশখালী for Arabic *shams* (the sun), শাল for Arabic *sāl* (the year), etc. The reason is that all the sibilants are pronounced as palatal by the people of Bengal. The representation of the sound of English *w* in বেওা (Persian *bewa*, 'a widow') and the geographical name ধাওা is in the Perso-Arabic fashion, in which the letter *wāw* stands for *w* as well as *ū* and *o*. It may be noticed that the modern Bengali way of writing these words as বেওয়া and ধাওয়া is even more unscientific. The Assamese alphabet has a separate consonant for the sound which should have been borrowed in Bengali. Arabic *lāyaq* (fit) has been written as লাএক and not in the modern Bengali way as লায়েক. Document I uses ন for ণ in all cases while both the records often use medial *i* for medial *ī* and *vice versa* not only in foreign but also in Sanskritic words; cf. জিও, তিহত্তরী, বৃক্ষাদী, চারী, রানি, etc. Document II uses Bengali পাড় (Sanskrit *pāṭaka*, 'bank') in the form of পাহাড় which normally means 'a hill'.

The palaeography of the documents, which use the Nāgarī type of *anusvāra* and the Assamese type of ৱ in a few cases where it is distinguished from ব, is characterized by the use of (1) different forms of the same letters and signs, (2) the same or similar form of different letters, and (3) forms of letters and signs which became gradually obsolete after the introduction of the printing press. These three categories are illustrated below from Document I.

(1) Cf. ই in ইয়াদিকির্দ্দ (line 1) and লইয়া (line 11) with the same letter in দুই (line 9) and ইতি (line 12); জ in °রাজা and জিও (line 2), করজ (lines 3 and 12), জমিদারি (line 4), লাখিরাজ (line 9), etc.; medial *i* in ইয়াদিকির্দ্দ (line 1), জিও (line 2), তিহত্তরী (line 3), খরদিগী (line 9); ক in ইয়াদিকির্দ্দ সকল° (line 1), সরকার (line 7), লাএক (line 8), etc.; খ in লাখিরাজ খরদিগী (line 9), খাজানা and দাখিল (line 11); cursive ম in দিলাম (line 9), করিলাম (line 11) and regular ম in মহারাজা নন্দকুমার, etc.

(2) Cf. দ্দ in ইয়াদিকির্দ্দ (line 1) and কু in °কুমার (line 2), মজকুরে (line 8); ও in শও (lines 3, 9 and 10) and ত্ত in তিহত্তরী (line 3); ব and ৱ in মবলগ বার শও (line 10), রানিভবানি (signature) and elsewhere; ন and ল in সকল (line 1) and সন (line 3) and also elsewhere; মু in মুনিরপুর (line 5) and ঘ in বিঘা (line 9); এ in লাএক (line 8) and ত্র in পত্র (lines 3 and 12); subscript ব in রামেশ্বর° (line 6) and subscript ন in পচপন্ন (line 10); স in সকল (line 1), etc., and ইসাইদ and ইসাদ (upper margin), etc. It may be pointed out that, though ব and ৱ as well as ন and ল are written alike, in আরাজি (line 8) and খরদিগী (line 9), there may be slight trace of the slanting stroke about the upper angle of ৱ, while ল looks like ণ (not used in this record) in সামিল (line 6) and দাখিল (line 11).

(3) Cf. মু in মুনিরপুর (line 5); তি in তিহত্তরী (line 3), ইতি (line 12); উ and ড় (written without dot; cf. also পাটীকাবাড়ী in Document II, line 6) in উড়ম্বর (line 7), কু and ন্দ in নন্দকুমার (line 2); ঙ্ক in অঙ্কে and ধ্য in মধ্যে (line 4); রূ in রূপৈয়া (line 10); medial *ai* in রূপৈয়া (line 10) and চৈত্র (line 12), etc.

The palaeography of Document II is similar to that of the other record. But the slanting stroke of ৱ distinguishing it from ব is clear in it in

কল্যাণপুর (line 6), মজকুরে (line 7) and in the last letter in বিহারার (line 9). It also uses ণ্ in some cases. Medial *u* in পু is different in রায়পুর (line 5) and কল্যাণপুর (line 6). The *candra-bindu* is written without the dot in দিলাঁও (line 12) and ৺সাথ (line 13) in which the sign stands for শ্রীদুর্গা written at the top of the sheet or for the word ঈশ্বর[1]. Among forms that have become obsolete now, note স্ব in পরমেস্বরী (line 2), মপস্বল (line 8), রাজস্ব (line 15); ব্ in বৃক্ষাদী (line 14); ট্ট in তেহট্ট (line 10), etc.

An interesting feature in both the documents is that neither bears the signatory's seal and that the Rāṇī's two signatures, which were expected to be identical, are not the same. In Document II, the Rāṇī's name is apparently written by the person who wrote the record. The writer's name is absent in both the records probably to imply that the signatory was herself the writer. But this could hardly have been expected in the case of Document I wherein the record itself is written in an experienced hand while the signature is in a coarse handwriting. This raises the question whether Rāṇī Bhavānī was unable to write her name easily owing to lack of sufficient education or she was careless enough to allow others to write her name on documents. As we shall see below, it was certainly unwise on the Rāṇī's part to issue such documents which could be more or less easily forged.

DOCUMENT I

After the passage meaning 'Be it remembered', the name of the addressee is given as Mahārājā Nandakumār Rāy with জিও suffixed to it. This জিও is used now as জী or জীউ in an honorific sense; cf. also Hindī পিতাজী, রামচন্দ্রজী, etc. In Bengali, the son or a person standing in a similar position is honorifically addressed as বাবাজী which has also the form বাবাজীবন. It appears that জিও, etc., are modifications of Sanskrit *jīva* or *jīvana*. After the addressee's name, no word like সচ্চরিতেষু, as found in Document II, is noticed here. In the same context, we have often the word বরাবরেষু in Bengali records, in which the Sanskrit locative plural case-ending is suffixed to the Persian word *barābar* to convey the modified sense of 'addressed to'.

The next passage states that the document is a loan-deed (করজপত্র) written in San 1173 (given in both figures and words) and that the object (subject-matter) of the deed is going to be narrated in the sequel (কার্য্যঞ্চাগে). In this section, লিখনং, also found in Document II, should properly be লিখিতং which is generally noticed in such records, while সন ১১৭৩ এগারশও তিহত্তরী অঙ্কে should correctly be সন এগারশও তিহত্তরী অঙ্কে ১১৭৩, 'In the year eleven hundred seventy-three, 1173 in figures'. Year 1173 of the Bengali San, which is a modification of the Fasli era, corresponds to A.D. 1767–68.

The subject-matter of the deed is then given in two sentences, the first of which states that the signatory, Rāṇī Bhavānī, was transferring to the addressee, Mahārājā Nandakumār Rāy, 251 bighās of land styled আরাজি হাশীল লাএক জিরাত and attached to the villages of Munirpur, Rāypur, Makarampur (correctly *Mukarrampur*) and Rāmpurā under the jurisdiction of Taraf Rāmeśvarpur in Parganā Dhāwā, Sarkār Uḍambar, Mahāl Khāliṣa

[1] See below; also *Proc. I.H.R.C.*, Vol. XVIII, 1942, p. 89.

Sharīfa, lying within her Zamindārī, with লাখিরাজ খরদিগী. In আরাজি হাশীল লাএক জিরাত, which is Arabic, *jirāt* means 'arable or cultivated land', *hāṣil-lāyaq* 'fit for earning revenue' and *ārāzī* 'detached plots of land either rent-free or recovered from the retrocession of rivers'. The meaning of the whole expression is 'tax-producing arable lands in detached plots recovered from the retrocession of rivers' and we have actually some villages with names having *ārāzī* as a prefix, e.g. Ārāzī Madhupur near Berhampur in the Murshidabad district. In লাখিরাজ খরদিগী, *lākhirāj* means 'rent-free' and খরদিগী is *kharīdāgī*, 'ownership by purchase', the whole expression meaning 'right to enjoy tax-free land by virtue of purchase'. Thus Rāṇī Bhavānī was transferring by the deed her title to 251 bighās of rent-free land in favour of Mahārājā Nandakumār Rāy on receipt of Rs.1,255, i.e. Rs.5 per bighā.

In this section, *mauzā* (মৌজা) means 'a village', মৌজেহায় মজকুরে, 'in the above-mentioned villages' (cf. Arabic *mazkūr*, 'afore-mentioned'), আমলে 'in the possession or jurisdiction', and *mahāl* 'an estate or assessed property', while *shāmil* and *khāliṣa sharīfa* have already been explained above. Taraf is the subdivision of a Parganā which was itself the subdivision of a Sarkār or district. Sarkār Uḍambar and Parganā Dhāwā are mentioned in the *'Ain-i-Akbarī*. This Sarkār was also called Tāndā or Agmahal (Rājmahal) and comprised parts of the present Purnia and Santal Parganas districts of Bihar and of the Murshidabad district of West Bengal.

The next sentence states that Rāṇī Bhavānī received from the addressee 1,255 Rūpaiyās or Rupees as the total amount of price (মবলগ পন) and deposited the money in the Government treasury (খাজানা আমরাতে). Arabic *mablagh* means 'a sum', though in Bengali it is generally used in the sense of 'the total sum', while Sanskrit *paṇa* means 'price'. Arabic *khazāna* means 'the treasury', though it is used in Bengali to mean 'revenue or tax'. With *khazāna* in the Arabic sense, আমরাত may be Persian *'imārat*, 'dominion, authority', etc. But, if খাজানা is taken in the Bengali sense, আমরাতে may be Persian *'imāra* (account) with the Bengali locative case-ending তে suffixed to it. The Rupee is here called জিলিষ শীক্কা which means the current coin bearing the date in the regnal reckoning of the Mughul emperor (cf. *jalusī* and *sikka* explained above).

The last line means to say that the loan-deed was given by the signatory to the addressee for the purpose stated above and the date was the 11th Caitra of the current year of the Bengal San (সন শদর). Since the Bengali month of Caitra corresponds to March-April, the date would fall about the end of March, A.D. 1768. The word ইতি is used in the Bengali sense of 'end' both here and in Document II.

The document is signed by Rāṇī Bhavānī and two witnesses, viz. Lakṣmīnārāyaṇ Rāy and Mahendranārāyaṇ Rāy, both called কানুনগোই. Above the names of the witnesses occurs the word ইসাইদ or ইসাদ derived from Arabic *ishhād*, 'evidence, testimony'.

The word *kānūngo* really means 'an expounder of law', though in India it became the designation of 'a revenue officer', while *kānūngoī* meant 'the office of the *kānūngo*'. It is difficult to say whether কানুনগোই has been used in our record in the sense of a *kānūngo* or as an official belonging to his office.

It will be seen from the above analysis that, although the document is specifically called a loan-deed drawn by Rāṇī Bhavānī in favour of Mahārājā

Nandakumār, it really records the sale of 251 bighās of rent-free land by the former to the latter and also mentions the fact that the entire amount was deposited by the Rāṇī in the State treasury in payment of rent due from her. If the land was mortgaged against the loan, the conditions required to have been clearly stated in the record and it would have been called not a করজপত্র but a বন্ধকপত্র. The nature of the document and the fact that two officers of the revenue department were the only witnesses would suggest as if Nandakumār was the chief collector of the State revenue and the Rāṇī, having failed to pay up her dues in time, informally pledged some land to get extra time for making the payment, so that, if only the money was not ultimately paid, the Rāṇī would lose her lands to the State. This would, of course, explain how a sale-deed was represented as a loan-deed. The absence of the Rāṇī's seal on the document might, in that case, have been regarded as immaterial since the witnesses were two revenue officers of the State. In such cases, the money stated to have been borrowed was never paid or received.

But there is a great difficulty in accepting this easy interpretation of the document. Although Nandakumār was the Dewān of Nawāb Mīr Ja'far, he had to retire on the Nawāb's death in A.D. 1765 and the East India Company obtained in that year the Dewānī of the Subā of Bengal, Bihar and Orissa from the Mughal emperor, Shāh 'Alam II, and appointed Muḥammad Rezā Khān as the chief collector of the revenue of the Bengal region. It thus appears that, in March A.D. 1768, the Rāṇī could have only borrowed the amount from Mahārājā Nandakumār at Murshidabad for payment of her dues in the State treasury, though the revenue officers would have drawn up the document as in the former days when the *Mahārāja* was the Nawāb's Dewān. Otherwise, we have possibly to think that the record is a forgery which was meant to deprive the Rāṇī of some arable land belonging to her Zamindārī.

Supposing that the record is genuine, two points appear to us as striking. In the first place, it was certainly unwise on the Rāṇī's part to issue it without her seal and the signature of the writer, etc., as such a document could have been easily forged by the revenue officers. It was specially dangerous in view of the fact that the Rāṇī's signature on the record, if it was really hers, looks like that of an uneducated person. Of course, a seal could also have been forged, but apparently with some difficulty.

Secondly, the Rāṇī is found to have failed to pay the small sum of Rs.1,255 from her own treasury. If this is true, her financial position cannot be regarded as bright. Some of the probable reasons for such a state of affairs are discussed by us under Document II.

TEXT [1]

1. ইয়াদিকির্দ্দ (।*) সকলমঙ্গলালয়
2. শ্রীযুত মহারাজা নন্দকুমার রায় জিও (।*)
3. করজপত্রমিদং সন ১১৭৩ এগারশও তিহত্তরী
4. অঙ্কে লিখনং [2] (।*) কার্য্যঞ্চাগে (।*) আমার জমিদারি মধ্যে
5. মৌজে মুনিরপুর ও মৌজে রায়পুর ও মৌজে মকরমপুর

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[1] From a photograph.

[2] Properly সন এগারশও তিহত্তরী অঙ্কে ১১৭৩ লিখিতং.

6. ও মৌজে রামপুরা সামিল তরফ রামেশ্বরপুর আমলে
7. পরগনে ধাওা সরকার উড়ম্বর মহাল খালিশা সরিফা
8. মৌজেহায় মজকুরে আরাজি হাশীল লাএক জিরাত
9. ২৫১ দুইশও একান্ন বিঘা লাখিরাজ খরদিগী দিলাম[1] (।*) মবলগ পন
10. ১২৫৫ মবলগ বারশও পচপন্ন রূপৈয়া জিলিষ শীক্কা
11. দশ্‌ত বদশ্‌ত লইয়া খাজানা আমরাতে দাখিল করিলাম (।*)
12. এতদর্থে করজপত্র দিল[2] ইতি (।*) সন শদরতে ১১ চৈত্র (।*)

I[3]

1. শ্রীরানি(ণী) ভবানি-[3a]
2. দে [ব্যা] (ঃ*) (।*)

II[4]

1. ইসাইদ
2. শ্রীলক্ষ্মীনারায়ণ
3. রায় কানুনগোই (।*)

III[5]

1. ইসাদ 2. শ্রীমহেন্দ্রনারায়ণ
3. রায় 4. কানুনগোই (।*)

TRANSLATION

Be it remembered—

[To] Śrīyut Mahārājā Nandakumār Rāyjīw.

This is a loan-deed written in San eleven hundred seventy-three—1173 in figures. The object (subject-matter) is [narrated] below.

Within my Estate—attached to the village of Munirpur and the village of Rāypur and the village of Makarampur (Mukarrampur) and the village of Rāmpurā, under *Taraf* Rāmeśvarpur [in] *Parganā* Dhāwā [in] *Sarkār* Uḍambar, [in] *Mahāl* Khāliṣa Sharīfa—in the above-mentioned villages, I am giving [you] the title arising from purchase of rent-free [land in respect of] 251—two hundred fifty-one—bighās of land fit for earning revenue. Having taken from [your] hand to [my] hand the total price [of the land] amounting to 1,255—twelve hundred fifty-five—Rupaiyās in coins bearing the regnal year [of the Mughul emperor], I am depositing [the amount] in the Government treasury.

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[1] This word had been originally omitted through oversight and was later written above the line.

[2] i.e. দিলাম.

[3] This is written above the concluding section of the space covered by the document and has to be read keeping the latter to the left-hand side.

[3a] ভবানিদেবী for ভবানী দেবী is not wrong according to Sanskrit grammar.

[4] This is written in slanting lines in the upper right quarter of the sheet to be read from the angle of its upper right corner.

[5] This is written in slanting lines in the upper left side of the sheet on a level lower than II and has to be read from an angle opposite to that of the latter.

To this effect, the loan-deed is given. [This is] the end. Caitra 11 in the current year.

I

[This is the signature] of Śrī Rāṇī Bhavānī Devī.

II

Witness—[This is the signature of] Śrī Lakṣmīnārāyaṇ Rāy, the revenue officer.

III

Witness—[This is the signature of] Śrī Mahendranārāyaṇ Rāy, the revenue officer.

DOCUMENT II

At the top of the sheet we have the *maṅgala*—শ্রীদুর্গা, Durgā being one of the well-known names of the Mother-goddess. The record begins with the same passage as in Document I. Then comes the name of the addressee, viz., Parameśvarī Bewā. The Persian word *bewa* means 'a widow'.

The introductory section of the record following the part discussed above is similar to that of Document I. But, instead of করজপত্র, we have here পত্র which means both 'a letter' and 'a deed'. The date, viz. San 1192 corresponding to A.D. 1786–87, is then quoted in the same way as in the other document both in words and figures.

The record proper then begins with a sentence, in which the addressee was allowed to excavate a জলহরি or tank in মুদাফত Kalyāṇpur within Parganā Pāṭikābāḍī and Taraf Rāypur. The word জলহরি is used in the same sense in a passage quoted in J. M. Das's *Bāṅgālābhāṣār Abhidhān* from Kavikaṅkaṇ Mukundarām's *Caṇḍīmaṅgal* as follows:

খিড়কি উত্তরভাগে জলহরি তার আগে

প্রতি বাড়ী কূপের সঞ্চয়।

The word is possibly derived from Sanskrit *jalādhāra* modified to *jaldhari* through *jaladhara*. মুদাফত, from Arabic *muẓāfat* (annexed, added or resumed as land; recent or late as a person deceased), is used in the record in the sense of 'attached to', although it is often found in Bengali documents to mean 'the former owner of a property', e.g. মহাল মুদাফৎ গোপীকান্ত সরকার, 'the property or estate formerly in the possession of Gopīkānta Sarkār'. মুদাফত কল্যাণপুর here really means 'land under the jurisdiction of the revenue-collection station at Kalyāṇpur'. Otherwise মুদাফত is a mistake for মৌজা.

The next sentence states that, for the said purpose, a plot of fallow land in an area separated from the rental of the Estate (খারিজ জমা, Arabic *khāriji jamā*) and attached to the Zamindār's establishment away from his headquarters (মপস্বলখানা মধ্যে, from Arabic *mufaṣṣal* and Persian *khānah*), according to records (মাফিক ফৰ্দ্দ), lying to the north of the house of Bairāgīdās Bihārā and to the south—touching the boundary—of Tehaṭṭagrām in Shamskhālī, was allotted to the addressee. The area of the land given was originally written ৴১ এক বিঘা (i.e. 1—one—bighā), in which ৴১

stands corrected to ⁄8 (i.e. 4). It appears further that the original ⁄১ এক was corrected ⁄8 চাইর, though চাইর was subsequently rubbed off apparently because the corrections in the word were too obvious to pass as original writing.

The following few sentences mean to say that the addressee should have the tank excavated on the said plot of land, that she should dedicate the water of the tank to God so that it would be available to all people without restriction, that only the embankment on the four sides of the tank would be the addressee's exclusive possession, on which she could plant trees, etc., for enjoying their produce, and that no rent would be demanded for the land by the Zamindār. Thus Parameśvarī had no right to the water of the tank, which was meant for the use of the public of the area. This idea has been expressed in the passage জল ৺সাথ করহ (Make the water God's property), in which ৺ stands, according to a well-known convention, either for শ্রীদুর্গা at the top of the sheet or for the word *īśvara*, 'god', and ঈশ্বর-সাথ no doubt stands for Sanskrit *īśvarasāt* (cf. *ātmasāt* which is of common use in Bengali). In some cases, the name of the king or donor is mentioned above and it is indicated by the sign in its proper place in the document.

The concluding part of the record is similar to that of Document I. There are only slight changes. The date is given here as the 20th of the Bengali month of Jyaiṣṭha corresponding to May-June, so that it would fall about the beginning of June A.D. 1786. An endorsement refers merely to 'the later part of the current year' (সন সদর আখেরি) probably indicating that the excavation of the tank would have to be completed by that period. The signatory is called Mahārāṇī in this record.

Shri Chittapriya Mitra mentions the circumstances under which the document was issued by Rāṇī Bhavānī, though it is not clear whether he secured all the information from local enquiry or part of it was the result of his inadequate study of the record. He says that the document was found in a house at Murshidabad and that it was given while the Rāṇī was travelling from one part of her Estate to another and was passing through a village inhabited by the Sadgop community. Drinking-water was not easily available at the village and the widow Parameśvarī managed to get some water for quenching the Rāṇī's thirst. Bhavānī became pleased and gave the widow some land and money for the excavation of a tank and the construction of a temple. There is, however, no mention of any money or temple in the document.

That the record was issued without the Rāṇī's seal and the signatures of the writer and witnesses show that Bhavānī was an extremely unwise administrator, since, as already indicated above, such a document could be quite easily forged. The changes made in the record fraudulently in Parameśvarī's interest at a later date show that the Rāṇī's administration was corrupt or weak. This reminds us of a story told to us by a gentleman of Rajshahi. Some men, while travelling in a boat, were passing by a prosperous village. When the leader of the party learnt on enquiry that the village lay within Rāṇī Bhavānī's Zamindārī, he suggested to his men, তবে লাগা এক কিস্তি (Let us then collect an instalment of the villagers' dues to the Zamindār). They then entered the village and represented themselves as sent from Nāṭor for the collection of revenue. It is said that they did not experience much difficulty in collecting a good sum of money to be shared among themselves. The worthless administration was coupled with the draining of the resources of the Zamindārī by the Rāṇī's liberality

and religious activity. She exhibited great zeal in building temples, excavating tanks and giving lands to gods and Brāhmaṇas. There is a saying among the people of Rajshahi that the Brāhmaṇa who does not enjoy any rent-free land granted by Rāṇī Bhavānī is no Brāhmaṇa at all. In view of the fact that documents like hers could be forged without much difficulty, it is not easy to say how many of the records in the possession of the Brāhmaṇas and others were genuine. In any case, there is little doubt that Rāṇī Bhavānī's administration was at least partially responsible for the ultimate ruin of the Zamindārī of Nāṭor.

TEXT [1]

শ্রীদুর্গাঃ—[2]

1. ইয়াদিকির্দ্দ (।*)
2. শ্রীপরমেস্ব(শ্ব)রী বেওা
3. সচ্চরিতেষু[3] । পত্রমিদং
4. সন ১১৯২ এগার শও বিরানব্বই
5. অঙ্কে লিখনং[4] (।*) কার্য্যঞ্চাগে (।*) তরফ রায়পুর
6. মুদাফত কল্যাণপুর পরগণে পাটীকাবাড়ী
7. মুদাফত মজকুরে একটী জলহরি খনন করিবা (।*)
8. তদর্থে মাফিক ফর্দ্দ মপস্বলখানা মধ্যে বৈরাগী-
9. দাশ(স) বিহারার বাটীর ওত্তর[5] সমশখালীর
10. তেহট্টগ্রামের দক্ষিণদিগে সেমানা[6] লাগা
11. খারিজ জমা পতিত ⁄৪...[7] বিঘা জমি
12. তোমাকে দিলাওঁ (।*) জলহরি খনন করিবা (।*)
13. জল ৺সাথ করহ (।*) চারা পাহাড়[8] তোমার
14. দখল (।*) বৃক্ষাদী(দি) লাগাইয়া ভোগ করহ (।*)
15. রাজস্ব হরশাল মাফ (।*) এতদর্থে পত্র দিল (।*)
16. সন সদর ইতি ।— ২০ জৈষ্ঠ[9] (।।*)

I [10]

1. সন সদর 2. আখেরি (।*)

II [11]

1. শ্রীমহারানী(ণী) ভবানী- 2. দেব্যাঃ ।।—

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[1] From a photograph.
[2] This *maṅgala* is written at the top of the sheet.
[3] Correctly সচ্চরিতাসু which is in Sanskrit.
[4] Properly সন এগারশও বিরানব্বই অঙ্কে ১১৯২ লিখিতং.
[5] Correctly উত্তর.
[6] Correctly সীমানা.
[7] As indicated above, originally ⁄১ এক was written. It was later changed to ⁄৪ চাইর. But ultimately চাইর was rubbed off.
[8] i.e. চারিপাড়.
[9] Correctly জ্যৈষ্ঠ.
[10] This is written in slanting lines at the space to the right of lines 1–5 and has to be read from the angle of the right side of the upper part of the sheet.
[11] This is written in the upper right space to be read keeping the writing of the document at the left-hand side.

TRANSLATION

Śrī Durgā.

Be it remembered—

To Śrī Parameśvarī Bewā who is virtuous.

This is a deed written in San eleven hundred ninety-two—in figures 1192. The object is [narrated] in the sequel.

Taraf Rāypur, *Muẓāfat* Kalyāṇpur, *Parganā* Pāṭīkābāḍī—in the above-mentioned *Muẓāfat*, you should excavate a tank. For that purpose, I am giving you 1—one—bighā (later corrected to '4—four—bighās') of fallow land which is property detached from the rental of the Estate, lying to the north of the house of Bairāgīdās Bihārā [and] to the south—adjoining the border—of Tehaṭṭagrām which is a part of Shamskhālī.

You should excavate the tank. Dedicate the water [in the name] of God. The four embankments [of the tank] will be in your [exclusive] possession. Plant trees, etc., [on them] and enjoy [their produce]. The revenue is exempted for all years.

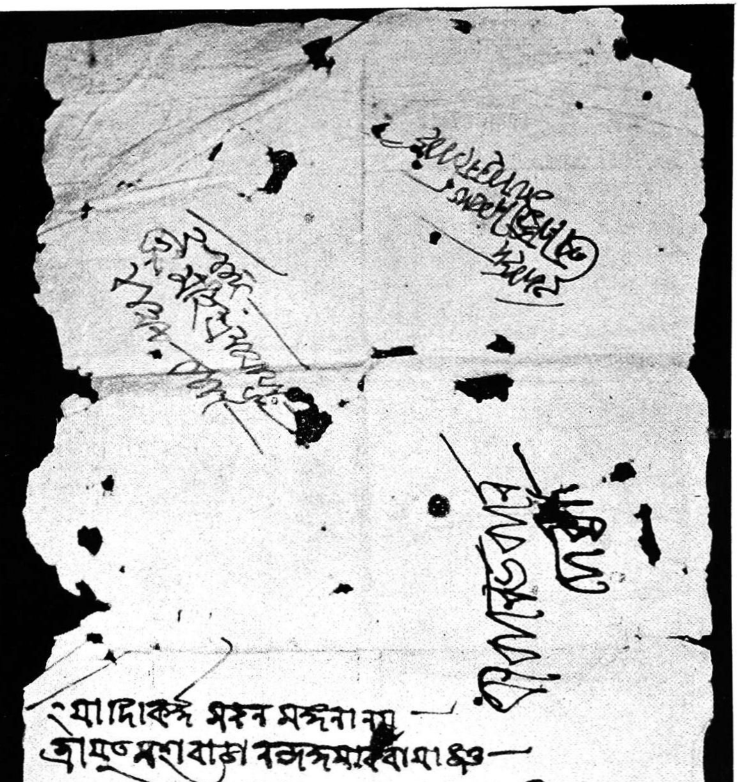
To this effect, I am giving [you this] document [during] the current year. [This is] the end. Jyaiṣṭha 20.

I

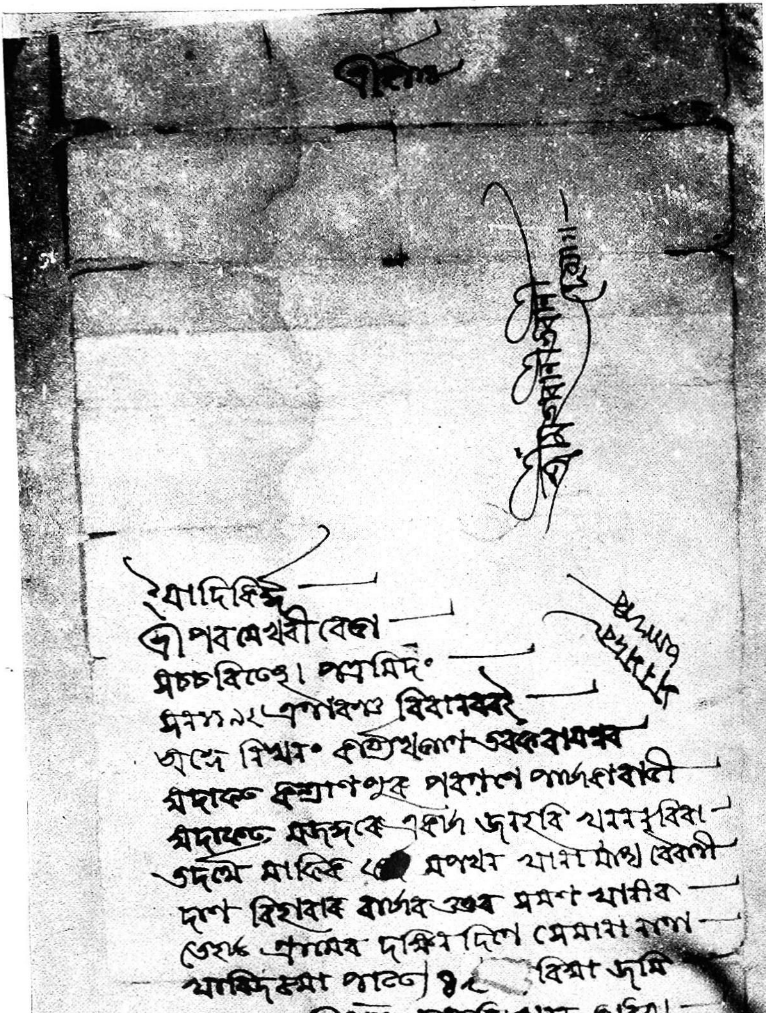
The concluding part of the current year.

II

[This is the signature] of Śrī Mahārāṇī Bhavānī Devī.



Document I



Document II

Journal of the Asiatic Society.
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THE PROTHALLUS OF *PHYMATODES NIGRESCENS* (BL.) J. SM.

By (MRS.) SUNANDA PAL *

Though our knowledge on the gametophytic generation of ferns is considerably broadened during recent years, information on the family Polypodiaceae (*sensu stricto*) is still very inadequate. Except that of Dr. Stokey's (1954 with Atkinson, 1959) contributions on the genera *Platycerium* and *Polypodium*, practically no critical observation has so far been made outside India. Out of so many genera of Polypodiaceae represented in India, only a few genera, i.e. *Drynaria*, *Pseudodrynaria*, *Loxogramme*, *Drymoglossum*, *Pyrrosia*, *Lepisorus* and *Microsorum*, have been investigated (Nayar and Kachroo, 1953; Nayar, 1954, 1955, 1957, 1958, 1961*a*, *b*; Kachroo, 1955; Pal and Pal, *in press*).

Phymatodes is a tropical epiphytic genus comprising of about 40 species out of which several taxa occur in India. In an attempt at studying the gross morphology, anatomy and cytology on several members of the genus, it was found that *P. nigrescens* is very distinct in many a feature from the rest. Accordingly, it was decided to investigate whether this taxon shows any difference with other species of the genus regarding the development and structure of the gametophyte.

MATERIALS AND METHODS

Mature spores of *Phymatodes nigrescens* (Bl.) J. Sm. were collected from the nursery of the Indian Botanical Gardens, Sibpur, Howrah, during the months of April to June. Cultures were made both in pots with soil mixtures and Petri dishes with agar media. The early stages of gametophytes were examined from Knop's and Benedict's agar media. For advanced stages cultures were raised in different soil mixtures of which the mixture constituting compost, soil, sand and brick chips in proportion of 2 : 1 : 1 : 1 was found to be most satisfactory. The culture media were sterilized at one atmospheric pressure for 15–20 minutes before use. Early stages of development were studied from whole mounts only. Mature gametophytes bearing sex organs were fixed in different fixatives of which weak formalin-propionic-alcohol gave most satisfactory results. Sections were cut at 7 μ to 11 μ thick and stained with Heidenhain's or Delafield's haematoxylin using Bismark brown as a counter stain.

OBSERVATIONS

The spores germinated after about a month of sowing. The percentage of germination and the rate of growth of the gametophytes were dependent upon the seasonal variations.

After sowing, the spore gradually swells and the intine protrudes out along the linear scar of the spore coat. Oil globules which are abundant in the spore gradually disappear and the germ tube becomes green prior to any division. The germ tube divides by a series of transverse divisions and the first vertical division appears in the terminal segment when the

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filament is about 5–6 cells long (Figs. 1–3). The first rhizoid is produced early from the basal cell and later a few more appear from the posterior cells of the filament (sometimes even from the fifth cell from base). More than one rhizoid may be borne by a cell of the filament.

If the conditions are unsuitable, particularly when the cultures are overcrowded, the germ filament becomes unusually long (Fig. 10). In other cases, occasional branching of the gametophyte is also noted (Figs. 5–7). Branching occurs from the second to sixth cell of the filament and in such branched gametophyte the terminal cell of the main filament may later bear one or more rhizoids (Fig. 6). Various types of irregularities in the development of the gametophytes have also been noted in several other genera of Polypodiaceae (Bauke, 1878; Straszewski, 1915; Stokey and Atkinson, 1954; Nayar, 1954, 1955, 1957, 1961*a*, *b*; Nayar and Kachroo, 1953; Kachroo, 1955; Pal and Pal, 1960).

After the vertical division in the terminal cell, one of the daughter cells grows faster and thus the vertical wall becomes obliquely placed (Fig. 3). Then another division occurs in the larger cell at right angle to the previous one which eventually appears to be slanting (Figs. 7, 10). Few more similar divisions occur in the terminal tier of cells and simultaneously the penultimate and few other cells below undergo vertical divisions (Figs. 4, 9, 11–13). Thus the gametophyte attains a flattened shape.

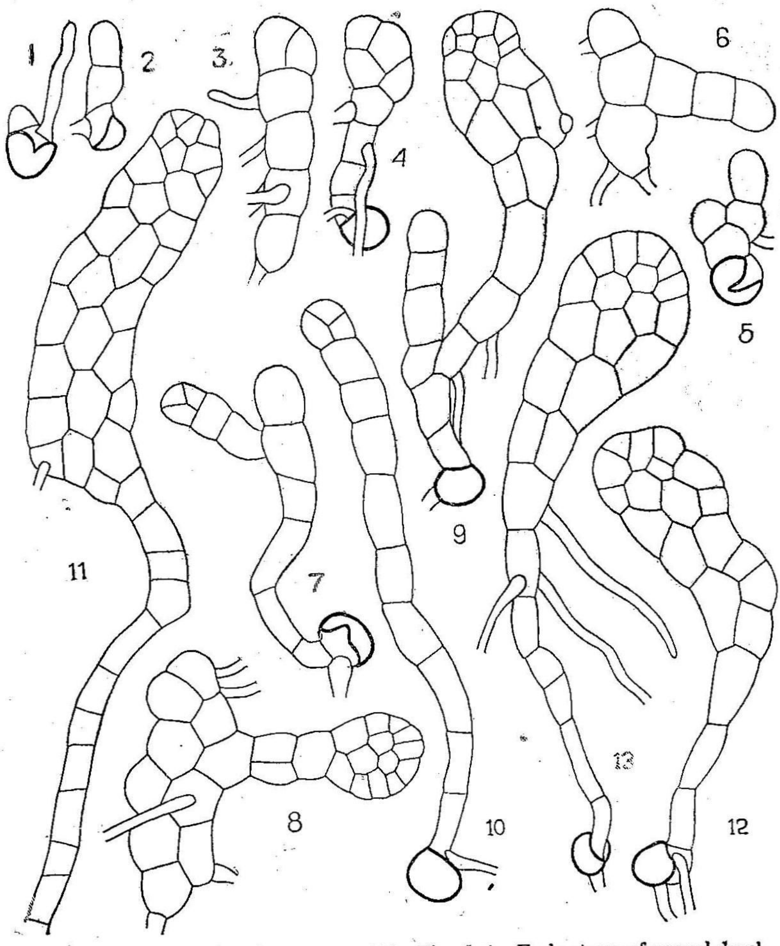
In course of this development, a wedge-shaped three-sided cell with two cutting faces may become differentiated at an early or later period of growth in the apex of the gametophyte which shows little activity and divides infrequently without any regular sequence. The growth of the flattened gametophyte is somewhat diffused as many cells in it show some activity. Soon some median marginal cells at the apex of the gametophyte divide repeatedly by anticlinal walls (a few divisions may also be periclinal) and thus an apical marginal meristem becomes differentiated (Figs. 8, 9, 11–15). By its activity the anterior end of the gametophyte attains a globular shape followed by the appearance of two lateral lobes. Now the thallus grows bilaterally forming two wings and a median notch denoting the growing point.

The basal end of the prothallus generally remains uniseriate and consists of 2–4–7 cells. Sometimes all these cells may divide vertically and in some others this region may become highly curved (Fig. 15). Formation of secondary thallus by branching is also noted (Fig. 8) where the growth of the primary thallus becomes arrested. Such irregularity has also been noted in *Pyrrosia* (Kachroo, 1955), *Microsorum* (Pal and Pal, *in press*), and in some other species of *Phymatodes* (Pal and Pal, 1960).

Under suitable conditions the gametophytes become lobed within 4–5 weeks after germination. The two lobes may remain distinct from each other or sometimes they may overlap. The apical region of the thallus remains erect as noted in *Pyrrosia* (Kachroo, 1955), *Microsorum* (Pal and Pal, *in press*) and species of *Phymatodes* (Pal and Pal, 1960). The cell walls of the prothallus remain unthickened and the cells at the median region are comparatively larger than the marginal ones. The midrib region is consisted of 3–5 tiers of cells whereas the wings remain one-cell thick. The average length by breadth of the mature thallus is 3·4 mm. × 2·6 mm.

The rhizoids are characteristic on account of their brownish colour. These are as usual non-septate and arise abundantly from the lower surface (sometimes marginal) of the gametophyte, medianly and posteriorly (Figs. 14–16). Unicellular hairs also occur frequently and appear only after the establishment of the marginal meristem. Initially, the hairs are full of chloroplasts but gradually become colourless. The hairs generally

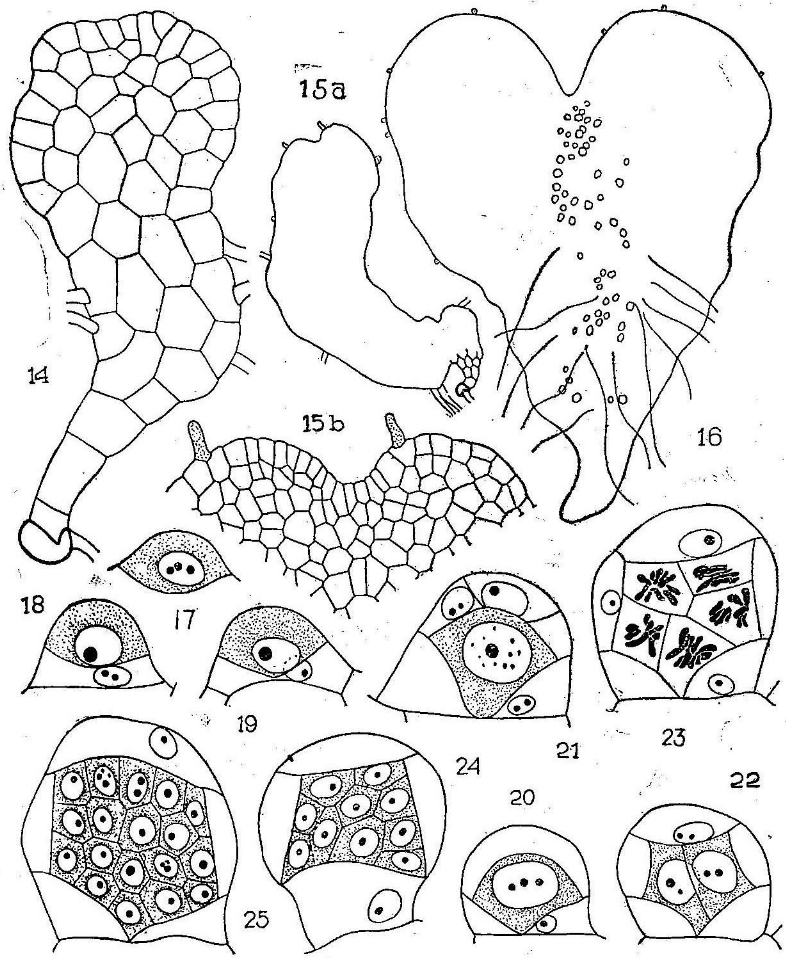
originate from the marginal cells and are distributed at the anterior region (Figs. 15–16), but their occurrence on the two surfaces specially near the midrib region has also been noted.



FIGS. 1–13. *Phymatodes nigrescens*. ×140 : Figs. 1–4. Early stages of normal development of the gametophyte. Figs. 5–9. Irregularities in growth habit. For further explanation see text. Fig. 10. A highly elongated filamentous gametophyte. Figs. 11–15. Flattening in the gametophyte.

The gametophytes are bisexual and, as usual, antheridia develop much earlier than archegonia. Antheridia generally appear within 5–6 weeks after the germination of spores on the under surface of the prothallus on and around the midrib region towards the posterior end. In one instance, however, these were found covering a vast area of the prothallus and occurring even very close to the apical notch (Fig. 16).

A wide papillate outgrowth is formed by a cell of the thallus which is soon cut off by a transverse (parallel to the surface) wall (Fig. 17). The outer cell, i.e. the antheridial initial, is later divided by a transverse wall. Due to the increasing turgidity in the upper cell, this transverse wall gradually extends below and ultimately touches the median region of the basal wall of the initial, thereby forming the first ring cell of the antheridium (Figs. 18–20). Sometimes this wall may remain straight so that the lower cell becomes a stalk cell (Fig. 24). Such a condition was also noted in *P. banerjiana* (Pal and Pal, 1960). The outer cell next divides by



FIGS. 14–25. *Phymatodes nigrescens*: Figs. 14–16. Later stages of development of the thallus (Fig. 15*b* showing details of apical region of Fig. 15*a*). For further explanation see text. Figs. 17–25. Developmental stages of the antheridium. For further explanation see text. (Figs. 14, 15*b*. ×140; 15*a*. ×30; 16. ×22; 17–25. ×680).

another transverse division laid down on the former transverse wall which has by this time become curved. Thus a central cell is differentiated which acts as the primary androgonial cell. The terminal cell now becomes dome-shaped due to the upward curvature of its basal transverse wall (Fig. 20). At the same time the dome cell enlarges and finally it is segmented by another transverse wall. This wall curves down and touches the former (dome-shaped) wall delimiting the second ring cell and a terminal cap cell (Fig. 21). None of these cells divides further. The first division of the primary androgonial cell is vertical and then successive divisions (simultaneously) occur in these cells resulting in the formation of androcytes (Figs. 22–25). The androcytes metamorphose and the antherozoids (about 64) are liberated through a pore formed in the cap cell.

The archegonia are also restricted at the under surface of the thallus. These are found on and around the midrib region near the apical notch. The development and structure of the archegonium is normal.

Discussion

Our knowledge on the mode of development and structure of the gametophyte of Polypodiaceae (*sensu stricto*), in comparison with that on the other fern families, is meagre. Stokey (1951) has remarked that we know practically nothing about it. Since then observations were made on a few genera of this important family. Now it appears that the gametophyte in Polypodiaceae has several characteristic features such as early development of brownish rhizoids, occurrence of vertical divisions in a few-celled (3–6) filament, flattening of the filament by means of several anterior cells, occurrence of a 'vestigial apical cell' and diffused growth in the early period of development, formation of an apical marginal (median) meristem, thin, cordate and decumbent prothallus and normal type of antheridial and archegonial development. The presence of unicellular marginal hairs as well as unicellular or multicellular superficial hairs are restricted only in a few genera. The occurrence of various types of irregularities in the earlier or later stages of development of the gametophyte, on the other hand, seems to be a common feature in the family.

Regarding the origin and function of the so-called 'apical cell' in this family a critical discussion has been made elsewhere (Pal and Pal, *in press*). The present observation also indicates the formation of a 'vestigial apical cell' (an apical cell showing little activity) as was found in other members of *Phymatodes* (Pal and Pal, 1960) as well as in *Microsorum* (Pal and Pal, *in press*). In other genera of the family, too, as appears from the relevant illustrations, a similar development takes place.

The germination of the spores in the present material is belated in comparison to other taxa of the genus. The rate of growth of the gametophyte is also slower but hairs develop early as was found in *P. scolopendria* (Pal and Pal, 1960). The nature of irregularities is also similar to that found in other species of the genus. The antheridial development follows the type normally found in the higher leptosporangiate ferns (Davie, 1951; Nayar and Kachroo, 1952).

Summary

In the present paper, the mode of development and structure of the gametophyte in *Phymatodes nigrescens* (Bl.) J. Sm. has been described.

Spores germinate in cultures after a month from the date of sowing. The germ tube comes out through the linear scar and grows into a uniseriate filament. Rhizoids are brown and they develop early from the

filamentous gametophyte. Vertical divisions occur in many of the cells of the filament and gradually the gametophyte becomes flattened. A vestigial apical cell may develop but the expansion of the thallus is mainly due to diffused growth. Later an apical marginal meristem is differentiated and the thallus attains a cordate shape. The prothallus remains one-cell thick except the midrib region. Irregular development of the gametophyte could be encountered in many cases.

In mature prothallus, rhizoids grow abundantly on the lower surface at the posterior region. Unicellular marginal hairs are formed from an early stage of development. These also occur superficially on both surfaces specially at the midrib region. The gametophyte is bisexual and protandrous. Antheridium development follows the usual leptosporangiate type.

Acknowledgement

Thanks are due to Dr. I. Banerji, D.Sc., F.N.I., F.A.Sc., for his kind interest and constant encouragement in this work.

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* Original not seen.

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NOTE ON THE DATE OF A MANUSCRIPT OF JĪVADEVA'S *BHAKTIVAIBHAVA*

By P. Acharya

Dr. D. C. Sircar made a communication discussing the date of a Manuscript of Jīvadeva's *Bhaktivaibhava* in the Asiatic Society, of which the following is the synopsis.

'This manuscript has been noticed in H. P. Shastri's catalogue, Vol. VII, pp. 274–78 (No. 5347). The post-colophon stanza in it is of exceptional interest to the student of East Indian history because it throws welcome light on the *gata-rājya* reckoning of Govindapāla and Lakṣmaṇasena. The verse states that the copying of the manuscript was completed on Sunday, Bhādra-sudi 11, in the 29th Aṅka (24th regnal year of Mukundadeva (A.D. 1559–68), the last independent king of Orissa. The details of the date show that it corresponds to the 18th August, A.D. 1583, though the king died 15 years earlier, and that the year has to be counted from Mukundadeva's accession and not from his death.' [1]

This date of the manuscript of the *Bhaktivaibhava* in the sixteenth century A.D. and the reckoning of the Aṅka year in Orissa in the *gata-rājya* of Mukundadeva Haricandana seem to be very unusual, and I was curious in investigating further on the subject. I was lucky in discovering another palm-leaf manuscript of Jīvadeva's *Bhaktivaibhava* in the library of the Utkal University, in which the post-colophon verse of the manuscript of the Asiatic Society occurs in word per word with this difference that it reads *khyāta-kīrter-asita-haridine Bhādrā-mase-hni Saure* whereas the Asiatic Society manuscript has *khyāta-kīrteḥ rajata-haridine Bhādra māse-hni Saure*, there being a difference of a fortnight only. The last two letters of the MS. of the Utkal University are missing due to the breakage of the leaf. They are found to be *guptiṁ* in the MS. of the Asiatic Society.[2]

The post-colophon verses of the two MSS. show that the copyist first wrote the MS. of the Utkal University library, for which he composed the post-colophon verse suitable for the date, and when he completed another MS. within a fortnight, he used the same verse with a slight change. *Asita* stands for the dark fortnight and *Rajata* for the bright fortnight of *Bhādrapada*.

I do not agree with Dr. Sircar as regards the interpretation of the weekday mentioned in the verse. Dr. Sircar has translated *ahni Saure* as Sunday; but I think it stands for Saturday. The copyist has *Saure*; but, if a visarga (*ḥ*) is added after it, the meaning becomes clearer as *Saureḥ ahni* (in the day of Sauri or Śani, i.e. Saturday). If the word *Saure* is taken as the locative of *Saura*, the meaning is still Saturday, because both the words *Sauri* and *Saura* are synonyms of *Śani*. When the word *Saura* is an adjective, it means 'relating to the sun' and its translation is 'the solar

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[1] Notice of the monthly general meeting of the Asiatic Society held on the 5th November, 1962. Dr. Sircar has further elaborately discussed the subject in his paper entitled 'A Manuscript of Jīvadeva's *Bhaktivaibhava*'. *Indian Studies—Past and Present*, Vol. IV, pp. 105–110.

[2] I am indebted to Pandit Banambara Acharya for informing me about the existence of the MS. of the *Bhaktivaibhava* in the Utkal University library. Pandit Acharya showed me the MS. which he has edited for publication.

day' and not 'Sunday'. In the commentary on the *Amarakoṣa* published by the Nirṇayasāgara Press, Bombay, 1907, verse 26 of Kāṇḍa, I, p. 20, *Saura* has been interpreted as *Śani* and not *Ravi* or *Āditya*. So Dr. Sircar's interpretation is untenable.

According to the calculation of Dr. Sircar, Bhādra-sudi 11, Sunday, in Mukundadeva's 29th aṅka, corresponds to the 18th August, A.D. 1583, and, naturally, Bhādra-vadi 11 should occur on Sunday in August, A.D. 1583; but it actually occurs on the 3rd August, 1583, on Saturday. This goes against his calculation.

Now let us examine the points regarding the Aṅka reckoning of King Mukunda Haricandana which, according to Dr. Sircar, continued up to the 29th Aṅka year or 24th actual year of reign, i.e. A.D. 1583, 15 years after his death. If this *gata-rājya* reckoning of Mukundadeva was popular and current in Orissa, we are sure to find its corroboration from other contemporary records of the period. After the Muslim conquest in A.D. 1568, Rāmacandradeva, the founder of the Khudra dynasty, assumed independence in Orissa and used his own Aṅka years. From A.D. 1583 to 1604 we find the use of his Aṅka years 24, 34, 38 and 47 which corrrespond respectively to A.D. 1587, 1595, 1598 and 1604. These years are found in the following stone inscriptions: (i) Baripada Museum bilingual inscription,[1] (ii) Sirjang inscriptions [2] and (iii) Kasiari inscriptions.[3] The findspots of these inscriptions are in the Mayurbhanj, Balasore and Midnapore Districts of North Orissa. The 24th Aṅka year of Rāmacandradeva is recorded along with the well-known Indian eras, namely Śaka 1509, Vikrama 1645 and Sāl 994; the 34th Aṅka year along with Yugābda 4690 and Śaka 1517; 38th Aṅka year with Yugābda 4699 and Śaka 1520; and 47th Aṅka year with Śaka 1526. These dates support the reckoning of the Aṅka years of Rāmacandradeva of Orissa from A.D. 1568. Thus the *gata-rājya* reckoning of Mukundadeva Haricandana from A.D. 1559 is not proved by any contemporary epigraphical records. So the 29th Aṅka year of Mukundadeva mentioned in the MS. of the *Bhaktivaibhava* corresponding to the 18th August, A.D. 1583, is not its real date.

Now the question arises as regards the identification of Mukundadeva in whose 29th Aṅka year these two MSS. of the *Bhaktivaibhava* were copied. As Mukundadeva Haricandana of the Cālukya dynasty did not rule up to his 29th Aṅka year, he is to be excluded for our purpose. The next Mukundadeva after Mukundadeva Haricandana in the history of Orissa is the name of king Mukundadeva of the Bhoi dynasty of Khurda, who ruled from A.D. 1659 to 1689.[4] Although Orissa came under the suzerainty of the Mughals since 1592, and the independent Rājās of Khurda were very often attacked by the Mughal governors of Orissa, the position of Mukundadeva is best described in A.D. 1660 by Maraqat-i-Hassan during the governorship of Khān-i-Duran, which is quoted below.

'When the Khān reached Katak, Rajah Mukundadeva of Khurda, the leading Zamindar of the country whose orders were obeyed by all other Zamindars, whom all other Zamindars of this country worship like a god, and disobedience of whose order they regard as a great sin, waited on him with due humility accompanied by other Zamindars and Khandaits of Central Orissa.'[5]

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[1] *Orissa Historical Research Journal*, Vol. VI, 1958, p. 228.
[2] *Ibid.*
[3] *Ibid.*
[4] *Navajīvana* (Oriya monthly), 1959, pp. 194–198.
[5] J. N. Sarkar, *Studies in Mughal India*, p. 208.

This Mukundadeva of Khurda dynasty enjoyed a rule up to 38 Aṅka years according to the calculation of Śrī Kedārnāth Mahāpātra who has specialized in the history of the Bhoi dynasty of Orissa from A.D. 1568 onwards. Śrī Mahāpātra has mentioned in his paper written in Oriya noted above the said king's Aṅka years of 3, 4, 5, 7, 10, 11, 12, 14, 15, 19, 21, 23, 27, 33 and 38 from various documents and so it is natural that Mukundadeva's 29th Aṅka year, which was then current in Orissa, was noted by the copyist in these two manuscripts of the *Bhaktivaibhava*.

Thus Mukundadeva mentioned in the MSS. of the *Bhaktivaibhava* is to be identified with Mukundadeva of the Bhoi dynasty who ruled from A.D. 1659 to 1689 and the dates of these two MSS. correspond respectively to Saturday, the 19th August, A.D. 1682, and Saturday, the 2nd September, A.D. 1682. This proves that Dr. D. C. Sircar's theory of the *gata-rājya* reckoning in Orissa as well as his calculation of the date of the MS. of the *Bhaktivaibhava* are not tenable.

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AN INTERESTING SPECIMEN OF THE BUST-TYPE VARIETY OF COPPER COIN OF CHANDRAGUPTA II

By A. K. Bhattacharyya

Copper coins of the Guptas are rarities in the whole range of the Gupta coins. It is generally not realized that like the predecessors of the Guptas, the Indo-Greeks and the Kushāṇas, to whose coin-types the Gupta coinage system owes so much in the matter of numismatic devices, the Guptas issued a large variety of copper coins. Of Chandragupta's copper coins at least 12 varieties are known, which include a bust type which has five sub-varieties. One of the sub-varieties showing a larger size of variety 'A' of Altekar (*Corpus of Indian Coins*, Vol. IV, p. 158) has the bust of the king fully occupying the obverse. Altekar states that only two specimens of this variety are known, one found at Ahicchatra and the other in Jhelum district. The former is in the collection of the British Museum and the latter reported in the *Catalogue of the British Museum* to have formerly belonged to J. P. Rawlins, Esq. (Allan: *Catalogue of Coins of the Gupta Dynasties in the British Museum*, p. 52).

The present coin, therefore, seems to be a third specimen of this type so far known, and in all likelihood originally collected from Kauśāmbī area. The coin belongs to the collection of late B. M. Vyas of Allahabad. Here the obverse shows the bust of the king to left wearing an *ekāvalī-hāra* (one-beaded necklace), a jewelled crown and *patrakuṇḍalas*. The portrait depicts the emperor in his middle age though with youthful vigour. As in the variety described by Altekar (*loc. cit.*), he appears here also to hold the stalk of a flower, part of which only is visible. The flowing robes around the shoulder are very artistically depicted. The prominent nose and square chin and deep eyebrows are very effectively shown in the present specimen. The reverse shows in the upper half Garuḍa with a halo and a pair of wings flowing down the sides. The standing posture of the bird is very characteristic, and the feet are quite clear and are planted on the narrow type of altar denoted by a couple of horizontal lines. The reverse legend which reads: (*Śrī*) *Mahārāja Cha* . . . The coin is in excellent state of preservation. The full numismatic description of the coin is as follows:

Large size—bust type:

Metal : Copper
Size : 19 mm.
Wt. : 6·52 gm.
Obv. : Bust of king, crowned with jewels, facing left, wearing necklace (*ekāvalī-hāra*), *patrakuṇḍalas*, holding flower stalk in right hand.
Rev. : In upper half Garuḍa, nimbate, standing, facing, with wings flowing down the sides. Below: (*Śrī*) *Mahārāja Cha* . . .

Obverse Reverse

Copper coin of Chandragupta II

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A LITHIC EPIC OF SOUTH-EAST RAJASTHAN— A FRESH STUDY

By Adris Banerji

Chirawa is now a small hamlet situated about ten miles north of Udaipur and about two miles east of Nāgdā, on the road which leads from Udaipur, *via* Nāgdā, Eklingajī and Delwāḍā, to Ajmer and Ahmedabad. It is now an all-weather-tarred road, reclining by the side of the hill, with a ravine immediately below it. Formerly, there was merely a track, along which mules, camels, bullocks, elephants, horses and *Dolis* used to climb precariously for crossing the Chirawa pass. The pass was blocked by a massive gate. The hill range has a local name which I have forgotten; but, in old days, possibly it was called Prājyala (*Prājyala-sannidhāne*, v. 34, of our inscription). The Śisodiyā chauffeur of the district pool jeep, which Śrī J. B. Shah, then Collector of Udaipur, had lent me, stated that during Muslim days the whole of Mewar was sworn not to divulge the way to Eklingajī and, at regular intervals, gateways had been built to check the progress of the unbelievers. The remains of these I saw all along the road. At the end of the pass, on the other side, where the tangled mass of hills, valleys, wolds and glens ends, eight miles from Kailāsapurī or Ekalinga, we reached Delwāḍā, with the feudal lord's castle situated on a rock. Politically and physically he was the *Marèchal* of this front, to which access was available from Ajmer. To retrace our steps, beyond the Chirawa gate, the village looms in the horizon, framed by the surrounding hills. Its medieval name was Chīrakūpa.

The inscription under discussion is to be found on a modern temple in the village of Chīrāvā or Chirawa. It is a veritable epic of the Guhilots and one of their baronial families. It is divisible into several parts. The first gives an account of the Rāvals of Nāgdā and Āhār. The second is devoted to the performances of one of their baronial families. Verse 5 deals with the deeds of Jaitrasiṁha and is the commencement of the historical portion. His father was Padmasiṁha, who was a son of Mathanasiṁha. The known dates of Jaitrasiṁha range from V.S. 1270 to 1309 (*c.* A.D. 1213 to A.D. 1253). His actual reign period might have been a few years more or less. The said verse informs us that his pride could not be humbled by the Mālavas, Gurjaras and the lords of Mārava, Jaṅgala and Mleccha. Sri R. R. Haldar pointed out that these facts are also mentioned in the Ghagsa inscription of his son and successor, Tejaḥsiṁha[1], dated in V.S. 1322 (*c.* A.D. 1265–66). Another inscription of the time of Rāval Sāmantasiṁha, dated in V.S. 1342 (*c.* A.D. 1285–86), credits Jaitrasiṁha with having destroyed Naddūla in Marwar and to having been engaged in battle with the Sindhuka army and defeated by a Turuṣka army[2]. Gurjara is probably some Gurjara chieftain, though Sri Haldar takes him to be a king of Gujarat. Mārava was the older name of Marwar, while Jaṅgala seems to have been Bikaner, though Sri Haldar identifies it with Ajmer. The Mlecchas were the Arabs of Sind and the Turuṣkas were the army of some Turco-Afghan Sulṭān of Delhi. I am unable to agree with Sri Haldar that the ruler of the Mlecchas was a Sulṭān of Delhi. In this respect, the Ghagsa record and the other inscription are quite clear.

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1 Rāval Jaitrasiṁha of Mewar. *Ind. Ant.*, Vol. LVII, pp. 31 ff.
2 *Ibid.*, Vol. XVI, pp. 349–50.

Jaitrasiṁha was succeeded by his son, Tejaḥsiṁha, who, according to some dated manuscripts, ascended the throne between V.S. 1309 and 1317, the last-known date of Jaitrasiṁha and the earliest known date of Tejaḥsiṁha[1]. Thus, for the Rāvals of Meḍapāṭa, we have the following succession list:

Mathanasiṁha
|
Padmasiṁha
|
Jaitrasiṁha, *alias* Jayatala, Jesalā, Jayasiṁha
|
Tejaḥsiṁha
|
Sāmantasiṁha

Evidently, the reign of Tejaḥpāla[2] was comparatively uneventful, except an invasion of Vāghelā Vīsaladeva, younger son of Vīradhavala, who also was known as Viśvala or Viśvamalla (A.D. *c.* 1245–46)[3]. His Kadi grant tells us that he 'resembled a hatchet, on account of his cutting the roots of creepers like turbulent government of the Meḍapāṭa country'[4]. Verse 9 of the Chirawa inscription refers to the deeds and benefactions of a family which held high offices under the Rāvals and, in doing so, it throws interesting sidelights on the tragic history of Mewar and the political conditions in Northern India.

The family was called the tāmtarāḍas of Nāgadrahapura. In this family was born a man named Uddharaṇa who, being able to protect the good and punish the wicked, was appointed by Rāvala Mathanasiṁha, the *talārakṣaka* of the *draṁga* (city) of Nāgadrahapura. The scope and function of the *talārakṣaka* is well defined by our epigraph in referring to the qualifications of Uddharaṇa. On the authority of Hemachandrasūri (*Deśinamālā*, 5.3.) and Trivikrama (1.3.105), it has been explained as *nagararakṣaka* or *purādhyakṣa*[5]. When in my boyhood I resided in Maharashtra, I found an equivalent post of the *Pāṭil*. I am informed by Sri M. K. Dhavlikar that, in old days, there was actually one *Pāṭil* combining the functions of police and the Pāṭwārī. But the East India Company separated the offices. It corresponds with the office of *talārī*, its Tamil equivalent being *taliyāri*. The *Śātruñjayamāhātmya* (I.4; X.132) mentions *talārakṣaka*. He was therefore the chief police official and magistrate of the city. Uddharaṇa had eight sons, the eldest of whom was Yogarāja who succeeded his father as *talārakṣaka* of Nāgadrahapura (v. 12). Two variants of the ancient name of modern Nāgdā, a deserted township in the Udaipur district, is available from this inscription, viz. Nāgadrahapura in verses 10 and 16 and Nāgahradapura in verses 12 and 34.

Yogarāja had four sons, viz. Pamarāja, Mahendra, Champaka and Kṣemā (v. 15). The eldest Pamarāja was killed in action with the troops of the *Suratrāṇa*, as mentioned in a previous paragraph, near the market square of a place called Bhūtālā (v. 16). Bhūtālā, as noted by Geiger[6] on the authority of Mm. G. H. Ojha, is Butālā, a village 12 miles from Nāgdā

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[1] Chirava Inscription, etc. *E.I.*, Vol. XXII, pp. 286 ff., footnotes 12 and 13.
[2] Ghagsa Inscription. *A.R. of Rajputana Museum*, 1927, p. 3.
[3] *Chaulukyas of Gujarat*, 1956, p. 204.
[4] *Ind. Ant.*, Vol. VI, p. 212.
[5] B. Geiger. *Vienna Oriental Journal*, Vol. XXI, pp. 145 and 146–7 and footnotes.
[6] Geiger, *op. cit.*, p. 150, footnote 4.

(possibly on the Delvāḍā side). Geiger said, 'Ich fand diesen ort nachtraglich auf der Karte Von Rajputānā als Butālā nordwestlich von Eklingjī verzeichnet in einer Entffernung, die den Von Mr. Ojha angegebenen entspricht...'[1] This *Suratrāṇa* Haldar has succeeded in identifying with Sulṭān Shāmsuddīn Iltutmish, on the strength of a drama called *Hammīramadamardana* of Jayasiṁhasūri, composed about A.D. 1229, which contains a graphic account of the conditions in Meḍapāṭa after Nāgdā, with its many temples and the fort on the hill immediately above the road to Ekaliṅga and Nāthdwara, was sacked[2]. For *haṭa-kuṭa* qualifying Bhūtālā, a reference may be made to lines 51–52 in the Khalimpur plate of Dharmapāla[3]. One of the Mewar inscriptions[4] edited by *Kavirāja* Śyāmaladāsa has the sentence *Śrī Chitrakuṭa-tala-haṭṭikā-maṇḍapikāyāṁ* (custom house or tollhouse). This *tala-haṭṭikā* still exists at the foot of Chitorgarh[5] and the road from the railway station passes through it. Till 1946 it was known as Tālheṭi; but now it has been renamed Pratāpnagar. It is a market-place even now. The inscription contains many terms of local dialect, and *haṭa-kuṭa* may be a local term like *haṭa-vāḍā*, *vāḍā* itself being a Gujar word meaning 'enclosed space'.

Mahendra, the second son of Yogarāja, had three sons: Bāla or Bālaka, Āhlādana and Vayaja. Bālaka was killed in a battle for Koṭṭāhaka, in the presence of Jaitrasiṁha, with Tribhuvana rāṇaka (v. 19). This Tribhuvana is no other than Tribhuvanapāla, the last of the Caulukyas. He came to the throne in V.S. 1298 (A.D. 1241–42) and possibly reigned up to V.S. 1302 (A.D. 1245–46)[6]. He was the son of Bhīma II. Geiger read the name as Koṭṭāhaka and Haldar as Koṭṭāḍaka and it has been identified with Kotrā in Mewar. Geiger's reading appears to be correct. Historico-geographical facts also support this reading and the identification with Koṭā, the headquarters of the district of the same name in Rajasthan. In the first place, Jaitrasiṁha invaded Gujarat and was not defending himself[7]. In the second place, the reign of Tribhuvanapāla was very short and inglorious, a fact which is evident from the omission of his name from the Gujarat chronicles and during this period he was worried by the revolt of the *Maṇḍalikas*. Thirdly, according to Udayaprābhasūri's *Sukṛtakīrttikallolinī* (verses 74–75), quoted by A. K. Majumdar, Ārṇorāja, an ancestor of Vīradhavala, defeated the kings of Meḍapāṭa and Candrāvatī. The ruins of this Candrāvatī is near modern Jhalrapatan in the Jhalawar district. The geographical evidence is supplied by the existence of the Baroda gap, through which Junaid led his raiding army and proceeded towards Al Bailaman, Jurz, Malibah, etc. This is the low fertile land between the Gulf of Cambay and the westernmost portion of the Vindhya range. The Sātavāhanas, the Early Cālukyas and the Rāṣṭrakūṭas paid attention to this gateway, giving access to the Indus valley and Rajasthan-Malwa. The area to the north of Jhalrapatan, including Hāḍāvatī, in which Koṭā is situated, rises by slopes to the level of an elevated plateau called 'Pāthār' and 'Uparmal', the most inaccessible portion of the Aravalli range.

The nature of this Uparmal and Pāthār has been described by Carlylle

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[1] Geiger, *op. cit.*, p. 150, footnote 4.
[2] *Ind. Ant.*, Vol. LVII (1928), pp. 31 ff.
[3] *Ep. Ind.*, Vol. IV, p. 250, lines 51–52 (together with *talāpāṭaka* and *haṭṭikā*).
[4] *Journal of the Asiatic Society of Bengal*, Vol. LV, Pt. 1, p. 47.
[5] S. L. Sastri: *Chitorgarh*, Udaipur, 1928, p. 46.
[6] Majumdar, *op. cit.*, pp. 203–4.
[7] Notes on War in Ancient India. *Journal of the Department of Letters*, Calcutta Univ., Vol. XIV.

and others, and becomes abundantly clear when one travels by road to Bhainsrorgarh on the Chambal in the Chitorgarh district, or through the Mukundārrā Pass, or to Bijholyā and Menal. This area was originally known as 'Hill Tracts of Mewar'[1]. The Aravalli here, for miles and miles, forms an impenetrable massif, with the exception of a few passes, and ends at Menal where it meets the plains of Malwa, with a break made by the Banas before it loses itself in the embrace of the Chambal. Then it extends up to Karaoli and Khushalgarh. Pāthār is the southern extremity of the Aravalli, where it branches to the south-east and east towards Ratangarh, Bijholiya, etc. Here it has converted itself into a huge and wide rolling tableland, precipitous on one side only. Since the location of Candrāvatī is well known, we may assume that, after the defeat of the ruler of Jhalawar, there was, possibly, a battle between the Gujarat army under Tribhuvanapāla and that led by Rāval Jaitrasiṁha near about the modern city of Kota, then known as Koṭṭāhaka, in which Bala fell. Either the Guhilot army was besieging a Gujrat garrison at Kota (cf. *grahaṇe*) or they were besieged.

Kṣemā, the fourth son of Yogarāja, secured the post of *talārakṣaka* of Chitrakūṭa (Chitor) from Rāval Jaitrasiṁha. So, he happens to be one of the earliest-known historical lords (*durgasvāmin* or *killāhdār*) of the celebrated fortress (v. 22). He had a son named Ratnā who lost his life, along with Bhīmasiṁha, in a battle, which took place at the foot (*talāṭṭi*) of the rock (v. 26). The *praśastikāra*, however, does not clarify the nature or the parties involved in the battle. There are several alternatives. It is possibly the incident referred to as *Meḍapāṭa-pṛithvī-vilalāla maṇḍalaṁ Jayatālaṁ*, mentioned in the *Hammīramadamardana*. Bhīmasiṁha, mentioned as a casualty, is probably *sīmāntamaṇi* mentioned in the *Hammīramadamardana* and *Sukṛtakīrttikallolinī* quoted by Majumdar[2]. The second alternative possibility was an invasion by the Sulṭān of Delhi. The contemporaries of Jaitrasiṁha were: Iltutmish, Ruknuddin Fīrūz Shāh, Rāziyāh, Muizuddīn Bahrām Shāh, Ālauddīn Māsud Shāh and Nāsiruddīn Mahmūd Shāh. In A.H. 647 (*c.* A.D. 1247) Jalāluddīn, brother of Nāsiruddīn, who had been sent as the Viceroy of Kanauj, was recalled. But that intelligent prince, suspecting danger, 'fled to the hills of Chitor', where his elder brother, after eight months of futile search, failed to apprehend him[3]. In A.H. 653 (*c.* A.D. 1256), another raid on Chitor by Saifuddīn Qutlugh Khān, who had married a queen of Iltutmish, took place. The Turco-Afghan baron revolted at Bharaich and escaped to Chitor, pursued by *Wāzir* Ulugh Khān. The *Wāzir* is reported to have destroyed the fort but failed to secure the person of the renegade[4]. In one of these, if our first hypothesis is incorrect and Bhīmasiṁha was not a Caulukya General hailing from Marusthalī (Marwar), Ratnā, son of Kṣemā, like Bādal, Jaimal and Pattā, probably lost his life.

His brother, Madana, distinguished himself in the battle of Uṭṭhunāka (modern Arthuna) while fighting the *Pāñcālaguḍikā* Jaitramalla in the service of king Jesalā *alias* Jaitrasiṁha. Jaitramalla is evidently Paramāra Jaitugudeva (*c.* A.D. 1243–56)[5]. He was appointed *talārakṣaka* of Citrakūṭa (Chitor) by Rāval Samarasiṁha and worshipped Śiva in the temple erected by Bhoja and known as Tribhuvana-Nārāyaṇa (vv. 30-31) and identified with Advadjī or Mokaljī's temple by Sri R. R. Haldar

[1] Modern Tālheṭi or Pratāpnagar.
[2] Majumdar, *op. cit.*, p. 156.
[3] Briggs: *Feristhah*, Vol. I, p. 238.
[4] *Ibid.*, p. 242.
[5] *Ep. Ind.*, Vol. XXII, p. 288.

on the authority of Mm. G. H. Ojha. But this identification cannot stand. The present Mokaljī's temple belongs to two epochs of Mewar history. The portions from *bhitta* to *vasantapaṭṭikā*, viz. *jagatī*, *pīṭha* and *vedībandha*, belong to Caulukya or Solaṅkī period, say, *c.* twelfth century A.D., its applied sculpture relating to *tīrthaṅkara-charitra*, while the rest was re-erected in the reign of Mahārāṇā Mokala and belongs to the classic phase of Guhila art. An inscription found on the temple informs us that Kumārapāla worshipped the god and granted it a village. This point had not been sufficiently evaluated in previous discussions. Nowhere in the epigraph is there any reference to any earlier benefaction which had lapsed like that recorded in the Dhanop inscription[1]. If it had existed, then the Hindu prince in whose territory it was erected must have granted some lands or villages for its maintenance. In the second place, the inscription was set up in its present position in the reign of Mokala, after it had been violated by Ālauddīn Khāljī. It is not the temple erected by king Bhoja of the Paramāra dynasty. The styles of architecture and sculptures are not Paramāra (Plate I).

In my opinion, Tribhuvana-Nārāyaṇa, or *Bhojasvāmijagatī*, is to be identified with Adbhutanātha's temple which is now deserted and contains an image of Maheśamūrti, just like Mokaljī's temple. Stylistically, both the images are similar. The present structure, to judge by the contents of the applied sculptures, was erected about fifteenth century A.D. and desecrated by the Gujarat Sulṭān. The proof of the existence of an earlier fane is furnished by the lower level of the sanctum, which is at a depth of 4′ 8″ from that of the floor of the *maṇḍapa*, similar to the southern chapel of the main shrine (*Mulagandhakuṭī-mahāvihāra*) at Sārnāth, the Uṇḍeśvara-Mahādeva temple at Bijholiyā and the Pātāleśvara temple before the *top-khānā* at Chitor.

The third part of the epigraph commences from verse 30 ending in verse 40 and concerns itself with the village of Cīrakūpa which was granted as a fief to Yogarāja by Rāval Padmasiṁha. It was situated in the outskirts of Nāgahrada, in the neighbourhood (*sannidhāne*) of the foothills (*pade pade*) of Prājyala[2]. The description is correct. As a traveller, proceeding from Udaipur, reaches the summit of the pass which provides access to the Nāgdā valley, closed by a medieval gate labelled on top as 'Chirāwā gate', the village bursts on one's vision, situated at the centre of an amphitheatre of hills. Its houses and temples are erected on mounds of ochre-coloured earth, containing possibly the ruins of medieval Cīrakūpa, if not still earlier remains. Beyond it, lie the ruined and deserted shrines of Nāgdā, its causeway, and perched on an eminence above them are the walls of a fort ascribed to 'Chitrang Mori' or Citrāṅgadā, the Mori King, by the local people. On a separate conical hill can be seen the temple of Rathasenā (Rāṣṭrasenā). The calm and peaceful valley, with the evidences of vandalism perpetrated in bygone ages, smiled serenely under an autumnal sun, surrounded by the Aravalli range. Yogarāja erected here the temples of Yogeśvara and Yogeśvarī which, in course of time, fell into ruins and were repaired by Madana who granted some land near the lake called Kālāya (Kālelā) which is probably the lake near Nāgdā, over which ruins of a causeway can still be seen. Uddharaṇa also built a temple called Uddharaṇasvāmin.

The fourth portion deals with the Pāśupata and Jaina *ācāryas*. Verse

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[1] *Ind. Ant.*, Vol. XL (1911), p. 174.

[2] This must be the hill, because the temple of Ekaliṅga was built on the hill known as Aśvagrāma in the reign of Allaṭa according to the Ekaliṅga inscription.

44 tells us that there was a Pāśupata *ācārya*, devoted to Ekaliṅga[1], named Śivarāśi. Most regrettably the record does not clarify whether he stayed at Chitor or Ekaliṅga. The latter is the possibility. D. R. Bhandarkar states that the suffix '*rāśi*' was generally used by Śaiva monks of the Lakulīśa sect[2]. He drew our attention to the fact that the *Kārāpakas*[3] bore the name Supujitarāśi, Sadyarāśi and Viniścitarāśi[4]. The Cintra *praśasti*, now in Portugal, refers to Kīrttirāśi, and Vālmīkirāśi. Dharmarāśi, a disciple of Uttamarāśi, rebuilt a temple of Śiva at Chotan in the Barmer district. A Chitorgarh inscription mentions Hārītarāśi, Maheśvararāśi and Śivarāśi[5]. At that time *Kavirāja* Śyāmaladāsa failed to identify Śivarāśi who was one of the successors of Hārītarāśi. Not merely that, but all the three inscriptions, the Ekaliṅgajī inscription of the time of Allaṭa, the Chitorgarh inscription already referred to and Chirāvā inscription, throw interesting sidelights on the mystic personalities of Hārītarāśi and Bappa or Bappaka or Bappa Rāval and the sectarian history of the Ekaliṅga shrine from *c.* eighth to *c.* tenth centuries A.D.

Hārītarāśi, the preceptor of Bappa, whatever might have been his real name and identity, was residing at or near Ekaliṅga, the modern Kailāsapurī, in whose neighbourhood in a hill village between Ekaliṅga and Delvāḍā, Bappa was alleged to have been born. The Chitorgarh inscription proves that he was a devotee of Ekaliṅga and a Pāśupata *ācārya*. Hārītarāśi was a Pāśupata as well as a leading devotee of the Lakulīśa cult, enunciated by Kuśika, etc., who were conversant with the Pāśupata *yoga* and who besmeared their bodies with ashes, had matted hair and used barks. According to Mewar annals, it was this ascetic who inspired Bappa to ascend the throne of Meḍapāṭa. Hārītarāśi was succeeded by Maheśvararāśi[6] and Śivarāśi who were attached to the temple of Ekaliṅga. But they could not have been his immediate successors. Since Hārītarāśi was a senior contemporary of Bappa who is supposed to have abdicated in *c.* A.D. 753 and since Śivarāśi was living in V.S. 1330 (*c.* A.D. 1273–74), the gap of 577 years could not have been filled up by two persons. There must have been other pontiffs of Ekaliṅga, whose names are not known to us. All of them, however, belonged to the Pāśupata-Lakūlīśa sect. The other interesting point is that the annals of Mewar credits Bappa of having acquired Chitor from the Mori kings who were *in all probability* of Hūṇa origin. But after visiting the area, a doubt has arisen in my mind, whether the *coup d'état*, if it can be called that, took place at Nāgdā or Chitor. If the tradition relating to the ruined fortifications on the hill below, and by the side of which the road from Nāgdā to Ekaliṅga passes, belonged to 'Chitrāṅg Mori' as related by a priest of Ekaliṅga, standing on the bank of the lake at the back of the Ekaliṅga shrine, is correct, then we have to assume that the Moris were first overthrown at Nāgdā. But traditions are often unreliable. Therefore, a mass of evidence requires to be garnered before the genesis of Guhila dynasty can be clarified.

The concluding portion of the inscription concerns itself with Jaina *ācāryas* of the *Caitra-gaccha* sect who were residents of Citrakūṭa. These were: Devabhadrasūri, Siddhasenasūri, Jineśvarasūri, with his pupil Vijayasenasūri, and Bhuvanacandrasūri, with his disciple Ratnaprabhāsūri.

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[1] Long before V.S. 1330 (A.D. 1273–74), the shrine of Ekaliṅga existed. It existed even before A.D. 971, as the Ekaliṅga inscription tells us.

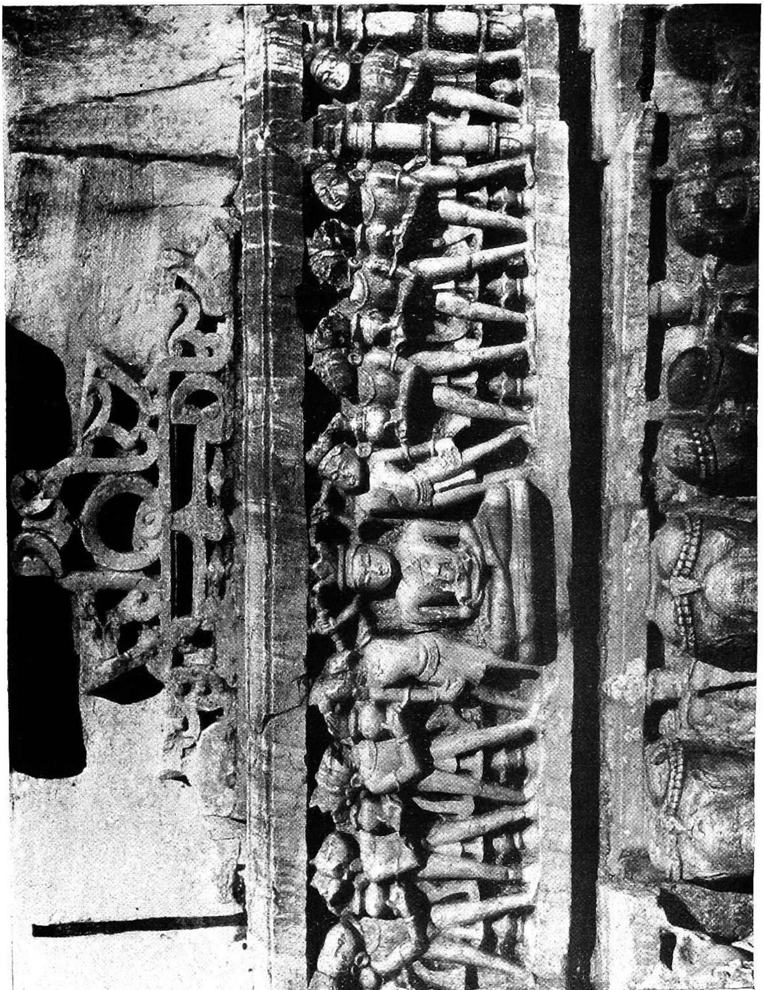
[2] Marshall, *A.R.*, *A.S.I.*, 1906–7, pp. 188–89.

[3] Those who erected the temple.

[4] *J. of the Bombay Branch Royal Asiatic Society*, Vol. XXII, p. 152.

[5] *J. of the Asiatic Society of Bengal*, Vol. LV, Pt. 1, pp. 40–48.

[6] *Ibid.*, p. 48.



Relief on the *bhitta* of Mokalji's temple, possibly *tīrthaṅkara-charitra*

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THE VĀLĪŚVARA TEMPLE AT TIRUVĀLĪŚVARAM[1]

By N. R. Banerjee

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A. Introductory

There is an excellent stone-temple (*Kaṟṟali*) of the early Chōḷa style at Tiruvālīśvaram, in the Ambasamudram *tāluk*, of district Tirunelveli, Madras, in the extreme south of India. The temple, called *Tiruvālīśvara-muḍaiyar* in the inscriptions, is dedicated to *Śiva* as its name implies. It is situated to the west of the rivulet, Kattana Nadi, branching off from the Tamraparni, in the midst of cocoanut groves and cultivated fields. For an abode of God it has an ideal setting of beauty, peace and serene beatitude. It can be approached from Brahmadesam, a larger village, about five miles from Ambasamudram railway station on the South Indian Railway. It is a temple marking a phase in the Pallava-Pāṇḍya-Chōḷa transition, situated deep into the heart of the Pāṇḍya country. Stylistically, circumstantially and on the basis of the indirect evidence of inscriptions on the temple, it is ascribed to the period of Parāntaka, some time before the accession of Rāja Rāja I Chōḷa as will be considered in some detail below. Today it goes by the name of *Vālīśvara* temple.

B. The Architectural Features

The temple unit consists of two shrines, one dedicated to the Great Lord and the other to the *Amman* (Goddess), and is surrounded by a *tirumadil* or enclosure wall built of stone.

It is a *samachaturāsra* or square *vimāna-dvitala* (two-storeyed) with octagonal *grīvā* and a *śikhara* and *stūpi* on top (Pl. I).

The main *vimāna* faces east and consists of a square shrine, the *garbhagṛiha*—with an *ardhamaṇḍapa*, a *mahāmaṇḍapa* and an *agra-maṇḍapa*—in an axial plan. The *agramaṇḍapa*, which is open, is a later addition and is not in keeping with the other axial structures.

[1] This paper was presented to the Archaeological Section of the All-India Oriental Conference in 1951. I am grateful to Dr. B. Ch. Chhabra, President of the Section during the session, for allowing me to publish it. I avail myself of the opportunity to acknowledge my indebtedness to Shri K. R. Srinivasan, my senior colleague in the Archaeological Survey of India, and his illustrious brother, Puravritta-jyoti Shri K. R. Venkataraman, for introducing me to the immense riches of South Indian architecture and sculpture, and for putting me in the way. For this paper, my first essay on the subject, I owe the inspiration to Shri K. R. Srinivasan, who has made valuable suggestions which have been incorporated.

The *garbhagṛiha* and the *ardhamaṇḍapa* rest on an *adhiṣṭhāna* or moulded plinth. The lowermost member of the plinth, namely the *upāna*, carries immediately over it a vertical *jagati* and a *kumuda*, which is octagonal in section, being chamfered. Over the *kumuda* runs a *vyāla vari*, which customarily projects at every corner in the form of *makara* heads. The *vyālas* are full-sized animals, all shown engaged in a stampede towards the west. This is surmounted by a simple *varimāna*, which forms the topmost member of the plinth or *adhiṣṭhāna*.

The quadrature of the plinth, as well as of the walls of the superstructure of the square *sanctum*, is broken by two recesses on each side making for three alternating bays in projection, the central one wider than the lateral ones. The corners of the projecting bays are cantoned by pilasters, square in section, as found in all early temples. The recesses between the projecting bays are plain.

The pilasters themselves consist of the usual components, namely a square shaft or *kāl*, *padmabandha*, *kalaśa*, *tāḍi*, the *kumbha*, *kaṇṭha*, *padma* and *phalaka*. The *padma* or *douciene*, below the massive *phalaka* or *abacus*, is a plain *ogee* moulding and not worked out in petals. The capitals of these pilasters carry cross-corbels or *podikai*, which are plain and bevelled as in all early Chōḷa temples, and not fluted as in the Pallava corbels.

Over the corbel rests the beam carrying a frieze of *Bhūtagaṇas* in various poses of dance and merriment, some with musical instruments. Many of them exhibit comic features with lion or monkey faces, pot-bellies, etc. The corners of this frieze or *Bhūtamālās* end in rearing *vyālas*. The beam is continued over the main walls of the *garbhagṛiha*.

The entablature is a carved cornice, the *kapōta*, projecting over the *Bhūta* frieze. The cornice is decorated at intervals with *kuḍus* made of a floral design around a circular centre. Floral decorations, i.e. *koḍikarukku* (*patralatā*), also occur between *kuḍus* and in the corners. These designs consist of flowers nestling among foliage and are reminiscent of embossed designs on metal eave plates. Above this *kapōta* runs another frieze of full-sized *vyālas* interspersed with stray elephants with the *vyālas* set in pursuit.

In the recesses of the wall are very shallow niches, not deep enough to contain any sculpture. They are flanked by square pilasters of the same type as described above. In the central projecting bay on each side of the shrine are similar shallow niches without any deities, unlike in the other temples of the period where the deeper niches contain appropriate deities. The absence of such niches containing deities (*devakōṣṭhas*) is a deviation from the later Pallava and the early Chōḷa structural temples elsewhere.

The superstructure of the *vimāna* rises into another storey as a diminished square, the top of this second storey carrying the drum or the *grīvā*; the dome of the *śikhara* terminating in the *stūpi*, all in stone, has been lost and was replaced at a very much later date by an inartistic and incongruous substitute in brick and stucco, marring the beauty of the structure (Pl. II, fig. 1).

While the lowermost storey (or ground-floor) has its wall, made up of alternating bays and recesses, the second *tala* has straight walls. On the four corners of the first *tala* or ground-floor and immediately over the four corner-bays of the wall are representations of four miniature shrines, *vimānas*, a square in plan with domical and four-sided *śikharas* and single *stūpi*. These four corner-shrines or *kūṭas* are hence called *karṇakūṭas* (Pls. I and II, fig. 1).

Over the central bays, in the middle of each side, are again four shrines, the *śālās*, rectangular in plan with wagon-top or barrel-vaulted *śikharas*,

the end faces of which have *kuḍu*-like openings with *siṁhamukha* finials on top (Pls. I and II).

The miniature shrines of both the types are adorned with miniature *kuḍus* with scroll and *makara* designs.

In between the corner and central *karṇakūṭas* and *kōṣṭhas* on each side described above, and placed over the two recesses, are what appear to be front views of apsidal ended or *gajapṛiṣṭhākṛiti vimānas*—the *pañjaras* (Pls. I and II).

In this storey of the rising superstructure, there are exquisitely carved *bas-relief* sculptures in front of the miniature shrines and also between them, depicting various forms of *Śiva*.

The second storey, which rises from behind the string of the miniature shrines of the first storey, is similar in design and is of slightly lesser height. Its four walls are adorned by a similar set of pilasters, as below, the top portions of which are visible, carrying a beam above. Over the beam is a *bhūtamālā* supporting a *kapōta* similar to the one in the *tala* below, but with straight sides and devoid of projections or recesses. There is a frieze of *haṁsas* running all round the top of the cube, an early feature, and is sheltered as it were by the overhanging *kapōta*. The *kapōta* is decorated as the one below, with four *kuḍu* ornaments and scroll work in relief. Over the *kapōta* runs a *vyāla* frieze with jutting *makara* heads in the corners. Placed on the four corners of this storey are four magnificently moulded bulls (*nandis*—recumbent) facing outwards, while in the centre is the octagonal base of the *grīvā*. The *grīvā* in its original state had apparently four niches on its cardinal sides enshrining appropriate deities.

The *ardhamaṇḍapa* in front, which is of lesser width than the shrine and rises on the extension of the same plinth, carries on its north and south side walls pilasters identical with those of the shrine. The *bhūtamālā* on the top, the *kapōta* over it and the *vyālamālā* frieze are but extensions of similar friezes and members of the main shrine. Unlike in other Chōḷa temples, there are no niches on the north and south walls of the *ardhamaṇḍapa* usually enshrining the images of *Gaṇeśa* and *Durgā* respectively. It is, therefore, of the same period as the main shrine.

The closed *mahāmaṇḍapa*, which is later than the main shrine, is a 16-pillared hall of greater width than the shrine. The pillars are cylindrical, carrying imitation Pallava corbels directly on their tops without the intervening capital members. The *maṇḍapa* has entrances on the east and the south. It is simpler in appearance than the shrine. The pilasters on the outside are similar to those on the walls of the shrine.

The covered cloister all round the temple and the *gōpura* entrance in front seem to be of the later Pāṇḍya period, i.e. twelfth-thirteenth century A.D. Surrounding this and the *Amman* shrine to the south is an outer enclosure or *tirumadil*, which is again of a later date.

C. Sculptural Embellishments

(i) *General characteristics*

The most remarkable feature of this temple is the extant sculptures adorning the front of the faces of the *karṇakūṭas*, *śālās* or *kōṣṭhas* and *pañjaras* in the first storey of the *vimāna* and those placed on the four cardinal faces of the *grīvā* and *śikhara*. Unfortunately, however, the sculptures on the eastern side of the first storey are covered by a massive modern terrace put up over the *ardhamaṇḍapa* in order to make it water-tight.

The sculptures deserve to be described at some length, not merely because of their quality and fineness, but also because some of them are

rare. The stone employed in the construction being coarse-grained accounts for some part of the coarseness of the otherwise finely executed sculptural elements.

(ii) *The sculptures on the southern side*

The five sculptures corresponding to the five miniature shrines over the entablature on the southern side are in the following order, from east to west (Pl. IV):

1. *Umāprasādana* (Pl. III, fig. 1), showing *Śiva* appeasing by a gentle caress *Umā*'s ire caused by his receiving *Gaṅgā* on his tresses. It occurs on the southern face of the south-eastern *karṇakūṭa*.
2. *Umā* and *Śiva* (Pl. III, fig. 1) standing in a pose of embrace or *āliṅgana*, while leaning against *vṛiṣabha*, occurs on the face of the *pañjara*. It may be described as *Vṛiṣabhāntika*.
3. *Naṭarāja* in *ānanda tāṇḍava* (Pl. III, fig. 2), with one foot planted on the recumbent *apasmāra*, occurs on the face of the central *śālā*. K. R. Srinivasan[1] considers it the earliest representation of this form in South India.
4. The face of the *pañjara* to the west of the central *śālā* shows a scene of the aftermath of *Dakṣayajña* (Pls. IV and V). *Śiva* stands in an attitude of blessing as the most important figure. *Pārvatī* stands in the background as *Satī*, and below her is *Dakṣa* with a ram's head which is possibly in the process of being fitted by a *gaṇa*.
5. The figure on the face of the *karṇakūṭa* in the south-west corner depicts *Śiva* as *Ardhanārīśvara* (Pls. IV and V) standing against a bull, with the *Śiva*, half, two-armed, and the *Pārvatī*, half, with a single arm.

(iii) *The sculptures on the western side*

There are likewise five sculptures on the western side in the following order from south to north:

1. The figure on the face of the south-west *karṇakūṭa* is of *Śiva* (Pl. VI) armed with bow and arrow and *mṛiga* and *paraśu*, and would be a representation of *Tripurāntaka* rather than of *Kirāta*.
2. The sculpture on the face of the adjoining *pañjara* depicts *Śiva* in the role of *Kālāri* or *Kālāntaka* (Pl. VI), with eight arms, and trampling upon *Kāla*.
3. The central *śālā* carries over its face the figure of *Śiva* as a *Liṅgodbhava-mūrti* (Pl. VII), flanked on the right by *Brahmā* and on the left by *Viṣṇu* in *añjali* pose, besides their zoomorphic forms of the *haṁsa* and *varāha*, respectively, seeking to meet the challenge by being poised above and below the form of *Śiva*.
4. On the face of the northern *pañjara* adjoining the central *śālā* is the figure of *Śiva* in *sukhāsana* (Pl. VIII, fig. 1) with a *yōgapaṭṭa* running round his bent-up left knee and waist. To his right, in the recess, is the figure of *Kāma* or *Manmatha*, the god of love,

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[1] K. R. Srinivasan: 'Some Aspects of Religion as revealed by Monuments and Literature of the South'. *Journal of the Madras University*, Vol. XXXII, No. 1, p. 190, Pl. IX B.

encircled by flames, caused by the wrath of *Śiva* at the disturbance to his meditation. To the left, in the recess, is the supplicating and mournful figure of *Rati*, the consort of *Manmatha*. This is, therefore, the depiction of *Śiva* as *Kāmāri* or *Kāmāntaka*.

5. The face of the *karṇakūṭa* at the north-west corner carries the figure of *Śiva* in his role of *Bhikṣāṭana* (Pl. VIII, fig. 1) with a *gaṇa* carrying the begging bowl over his head in front and a *Riṣipatnī* offering him alms to the right.

(iv) *The sculptures on the northern side*

The sculptures on the face as they occur from west to east are as follows:

1. The figure on the northern face of the north-western *karṇakūṭa* depicts *Pārvatī* performing the austerities of penance before her marriage to *Śiva* (Pl. VIII, fig. 2). She stands on her right foot, and the left is bent up at the knee in the posture of *Ūrdhvajānu*, surrounded by *pañchāgni* or five fires with her hands clasped before her in *añjali* and her face lifted up.
2. The next scene, on the face of the adjoining *pañjara* shows the fulfilment of *Pārvatī*'s penance, which was the theme of the previous panel. She is being led by her father, *Himavān*, to *Śiva*, who is seated. The entire scene conjures up the delightful aspects of *Kalyāṇa-sundara*.
3. The face of the central *śālā* carries the figure of *Śiva* in his benignly fierce aspect of slaying the elephant-demon (Pl. IX, fig. 1), holding up its hide with upraised hands as the background, flayed out from the body of the slain demon, and standing or dancing upon its head. In this role *Śiva* is described as *Gajāri* or *Gajāntaka*.
4. The face of the *pañjara* to the east of the central *śālā* depicts *Śiva* as *Chaṇḍeśānugraha-mūrti* (Pl. X, fig. 1). *Śiva* and *Umā* are shown as seated on the recumbent bull, and *Śiva* is in the process of tying the *nirmālya* (garland) round the head of supplicating *Chaṇḍeśa*, kneeling before the Lord, and gratefully receiving His grace.
5. The iconography of the figures on the face of the north-eastern *karṇakūṭa* is not quite clear, though it probably shows the figure of *Śiva*, seated in *sukhāsana* and a devotee performing *abhiṣeka*.

(v) *The sculptures on the faces of the grīvā*

The four sculptures on the four faces of the *grīvā* which are the only original remnants extant of this member are as follows:

1. The eastern face carries the figure of *Indra* seated on the *Airāvata*.
2. On the south is the seated figure of *Śiva* as *Dakṣiṇāmūrti* in his usual pose.
3. The western side depicts the seated figure of *Yōga-narasiṁha* (Pl. X, fig. 2), with a *yōga-paṭṭa*, around the knees and waist.
4. The northern side carries the figure of *Brahmā*, seated on a lotus.

(vi) *The sculptures at the entrance of the ardhamaṇḍapa*

The two *dvārapālakas* on either side of the entrance to the *ardhamaṇḍapa* are of characteristically early type. Both are two armed with a prominent

yajñōpavīta in the form of a twisted cloth. While the right hand is put up in *tarjanī* or *vismaya* pose, the left is resting on a massive club. Whereas the *dvārapālaka* on the south faces front with his left leg thrown round the club, that on the north is in half profile, body facing front, while the part below the hip is twisted away from the legs.

The interior of the *vimāna* is hollow as in all temples of the early Chōḷa period.

These features and the presence of the *Saptamātṛikā* group inside the temple and an early sculpture of *Gaṇeśa* point to a date before the eleventh century. Of this, the facts will be clear from a consideration of the inscriptional evidence regarding the temple.

The *Amman* shrine together with its original *ardhamaṇḍapa* occurring to the south-east of the main shrine is obviously a later addition, say about the twelfth or thirteenth century, as the architectural features indicate.

D. The Epigraphical Evidence on the Date of the Temple

The inscriptions in the temple, as stated already, are numerous and while helping to fix the date of the temple throw, as we shall observe, ample light on the life of the time.

It was the boast of Āditya Chōḷa that he studded both the banks of the Kaveri as far as the sea with *Śiva* temples. His son and successor, Parāntaka, emulated this, and the temple at Tiruvālīśvaram is in all likelihood an instance of his achievement.

In the battle of Vellur fought in A.D. 915, Māravarman Rājasiṁha II Pāṇḍya was completely defeated by the Chōḷa king, Parāntaka I, and the Pāṇḍya king was forced to flee from his kingdom, allowing his heritage to fall into the hands of his enemy. This was followed up by progressive conquest and occupation of the Pāṇḍya country by Parāntaka.

If the Parakeśarī mentioned in the Kuttalam inscription [1] in *Vaṭṭeḻuttu*, dated in the 31st regnal year of the king referred to, was Parāntaka, it could be conceded that the territory represented by the modern Tirunelveli district had come under his rule before his 21st regnal year.

There is also an inscription at Suchindram, district Nagercoil, Madras[2], dated in the 40th year of Parāntaka. The provenance of these inscriptions and the achievements attributed to Parāntaka point to the establishment of Chōḷa hegemony in the far south between A.D. 907 and A.D. 954. But there is an absence of Chōḷa records in the Tirunelveli country after the death of Parāntaka, until it was reconquered by Rāja Rāja I *before* his eleventh year of accession (i.e. A.D. 996)[3].

Two of the inscriptions in the temple in *Vaṭṭeḻuttu* script are both dated in the eleventh year of the reign of Rāja Rāja I. These and two others, also in *Vaṭṭeḻuttu* script, mention the village where the temple is situated as *Rāja Rāja Chaturvēdimaṅgalam*, a *brahmadēyan* (gift to Brahmins), in Mullināḍu.

The two undated inscriptions may also be connected with Rāja Rāja I, as they associated his name with the village, and this could not have happened before Rāja Rāja had conquered this part of the country, and they are also in *Vaṭṭeḻuttu* script, whereas the inscriptions of the subsequent period are in Tamil script.

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1 *A.R.E.*, 439 of 1917.
2 *E.I.*, V. 43, 82 of 1896.
3 *A.R.E.*, 116–119 of 1905.

Rājēndra I (A.D. 1012–1044), the son and successor of Rāja Rāja I, appointed princes of the blood royal as Viceroys, who administered the Pāṇḍya country and were styled 'Chōḷa-Pāṇḍyas'.

Jaṭāvarman Sundara Chōḷa Pāṇḍya, probably a son of Rājēndra, is mentioned in three [1] inscriptions in this temple. Two of his successors in the viceregal *gadi* mentioned here are Māṛavarman Uḍaiyār Śrī Vikrama Chōḷa-Pāṇḍya [2] and Māravarman Uḍaiyār Śrī Parākrama Chōḷa-Pāṇḍya[3].

In the reign of Kulōttuṅga I (A.D. 1070–1122), there were serious rebellions in the Pāṇḍya and Kērala countries, but he was able to reassert the Chōḷa supremacy. He did not, however, revive the Chōḷa-Pāṇḍya viceroyalty, but was content to leave the administration in the hands of its local rulers.

The decline of Chōḷa ascendancy, which began under Kulōttuṅga III, was completed in the times of Rāja Rāja III and Rājēndra III.

The Pāṇḍya supremacy reasserted itself in the time of Jaṭāvarman Kulaśekhara (acc. 1190). The later inscriptions [4] in the temple record, among others, the *praśasti* of Jaṭāvarman Kulaśekhara, 'who was pleased to take the Chōḷa country', and of Jaṭāvarman Vīra Pāṇḍya, who almost completed the Pāṇḍya victory over the Chōḷas and the Hoysalas. Thus, the inscriptions in the temple record closely the political changes in the country.

Incidentally, the inscriptions help also to fix the date of the temple. Though the earliest Chōḷa inscription in the temple is dated in the eleventh year of Rāja Rāja I (i.e. A.D. 996), it is unlikely that the name of the builder should be omitted to be mentioned if he were Rāja Rāja I himself, considering the fact that the village is named after him. It is most likely, therefore, that the temple would have come into existence in the time of Parāntaka, if not a little earlier.

The two earliest inscriptions in Tamil script in the temple are dated in the thirteenth and seventeenth years, respectively, of the Chōḷa-Pāṇḍya Viceroy—Jaṭāvarman Sundara Chōḷa-Pāṇḍya. These mention the name of the temple as that of Tiruvālīchchuram Uḍaiyār in Rāja Rāja Caturvēdimaṅgalam (village) in Mullināḍu (district) of Muḍikoṇḍa Chōḷavaḷanāḍu (province).

E. Light on the Social, Cultural and Economic Life during the Tenth to Thirteenth Centuries

These inscriptions present also vignettes of the social, cultural and economic life of this part of the country during the period from tenth to thirteenth centuries. As interesting record[5], probably of the reign of Rājēndra Chōḷa I, says that the temple and its priests and servants and the treasury were all placed under the protection of a battalion stationed there of a mighty army called the *Munrukai Mahāsenai* or 'the great army of the three arms or sections (probably elephant corps, infantry and cavalry)'. This great army had to its credit brilliant achievements in Kērala, the Malaināḍu the Veṅgi country, Ceylon, far off Śrī Vijaya (Sumatra); and its men were worshippers of *Viṣṇu* and *Śiva*. They are also mentioned

[1] *A.R.E.*, 115 of 1905, 327–330 of 1916.
[2] *A.R.E.*, 328 of 1916.
[3] *A.R.E.*, 329 of 1916.
[4] *A.R.E.*, 326, 331, 333–371 of 1916.
[5] *A.R.E.*, 120 of 1905.

in an inscription[1] in the Bhaktavatsala temple at Sermadevi dated in A.D. 1096; and from the exploits attributed to them, they formed an important section of the army of Rājēndra I. Several other temples in the neighbourhood were also under its protection. There is a record[2] in this temple of the gift of a cow to supply ghee for a lamp, which was in the charge of a commandant (*pādait-talaivan*). Another *senāpati* entrusted the *devadāna* village of *Śiva-charaṇa-śekharanallūr* to a family in that village. Close by was another cantonment[3], *Rāja Rāja Erivirappaṭṭiṇam*, where were stationed the *Eriviras*, who formed one of the divisions of the armies of the famous trade and merchant guild, '*nānādeśīya-tiśai-ayirattu ainnur-ruvar*', i.e. the 'five hundred' merchant guild.

The stationing of the army at this place may as well have been prompted by strategic considerations, as this position commanded the entrance to the southern Kerala country through the ghats and also along the coast through Cape Comorin; and Ceylon, with which the Chōḷas were perpetually at war, was right across the straits.

We get also an insight into the revenue administration of the times from the extant records. A record speaks of an order to the assembly of *Rāja Rāja Caturvēdimaṅgalam* stating that a newly founded hamlet was to be held as ryotwari tenure (*kaḍamai*) by the temple of Tiruvālīśvaram, while the proprietory right (*kārāṇmai*) was given to a local resident. The hamlet was a tax-free *devadānam*[4].

Uḍaiyār Sundara Chōḷa-Pāṇḍya is stated to have converted a part of the *brahmadēyam* land to ryotwari tenure[5] and before it was so done, it was made a *dēvadānam* land.

Inscriptions speak of the assembly of *Rāja Rāja Caturvēdimaṅgalam.* Obviously, it was a *sabhā* or assembly of Brahmans.

There are other inscriptions dealing with a number of texts and also with royal orders making lands tax-free.

As was usual during the period, the temple housed a number of *maṭhams*, one of them was *Grāmarājan tiru maṭham*, wherein were housed the devotees of the temple[6]. In the *Vīrapaṇḍitamaṭham* itinerant ascetics were fed. Frequent mention is made of the feeding of *Māheśvaras*. The names of some of them, *Aghora Deva, Sadāśiva Deva, Tatpuruṣa Deva*, indicate that they were *Śaiva āgamic gurus*. The *Golakī maṭham*, the priests of which were spread all over the land from Kashmir down to Banaras, and from Rāḍha country in Bengal and Chedi in the north to Tirunelveli in the far south, had its representatives in this village. Mention is made of two lines of disciples or *santānas*, namely the *Gnānāmṛitāchārya santāna*[7] and *Jiyar santāna*[8].

There are usual references to gifts for feeding, worship, burning of lamps and for the maintenance of flower gardens and for the conduct of festivals. Some of the festivals were conducted on the birthdays of the rulers. The temple had a number of dancing girls, some of whom made gifts of gold to the temple. One interesting order of Jaṭāvarman Kulaśekhara says that the paddy assigned to the temple for offering should be husked by dancing girls.

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[1] *A.R.E.*, 189 of 1895.
[2] *A.R.E.*, 330 of 1916.
[3] *A.R.E.*, 360 and 365 of 1916.
[4] *A.R.E.*, 368 of 1916.
[5] *A.R.E.*, 327 of 1916.
[6] *A.R.E.*, 355 of 1916.
[7] *A.R.E.*, 361 of 1916
[8] *A.R.E.*, 364 of 1916.

F. Conclusion

Thus, this temple built early in the tenth century far into the interior of the Pāṇḍya country is reminiscent of the glories of the Chōḷas, and the records inscribed on it provide ample information about the contemporary political, social, cultural and economic life. By itself, it is an excellent piece of art with well-proportioned architectural members and a profusion of delightful sculptures representing various forms of *Śiva* and legends connected with the Great Lord.

View of the temple from south-west, Tiruvālīśvaram

FIG. 1. Second storey of *vimāna*, Tiruvālīśvaram

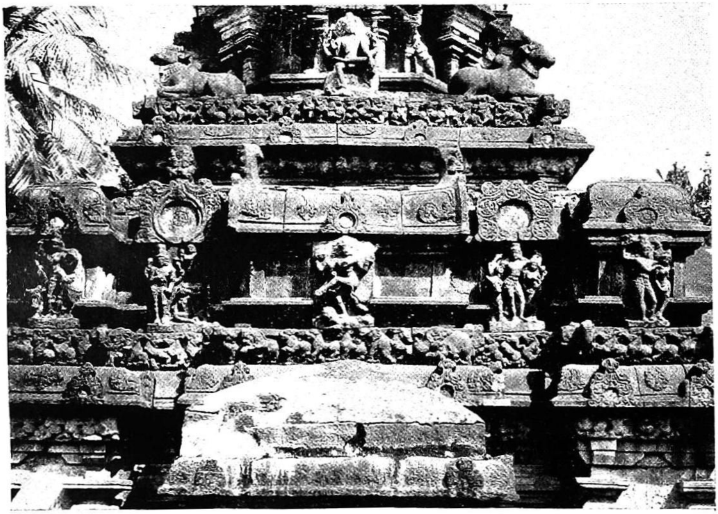
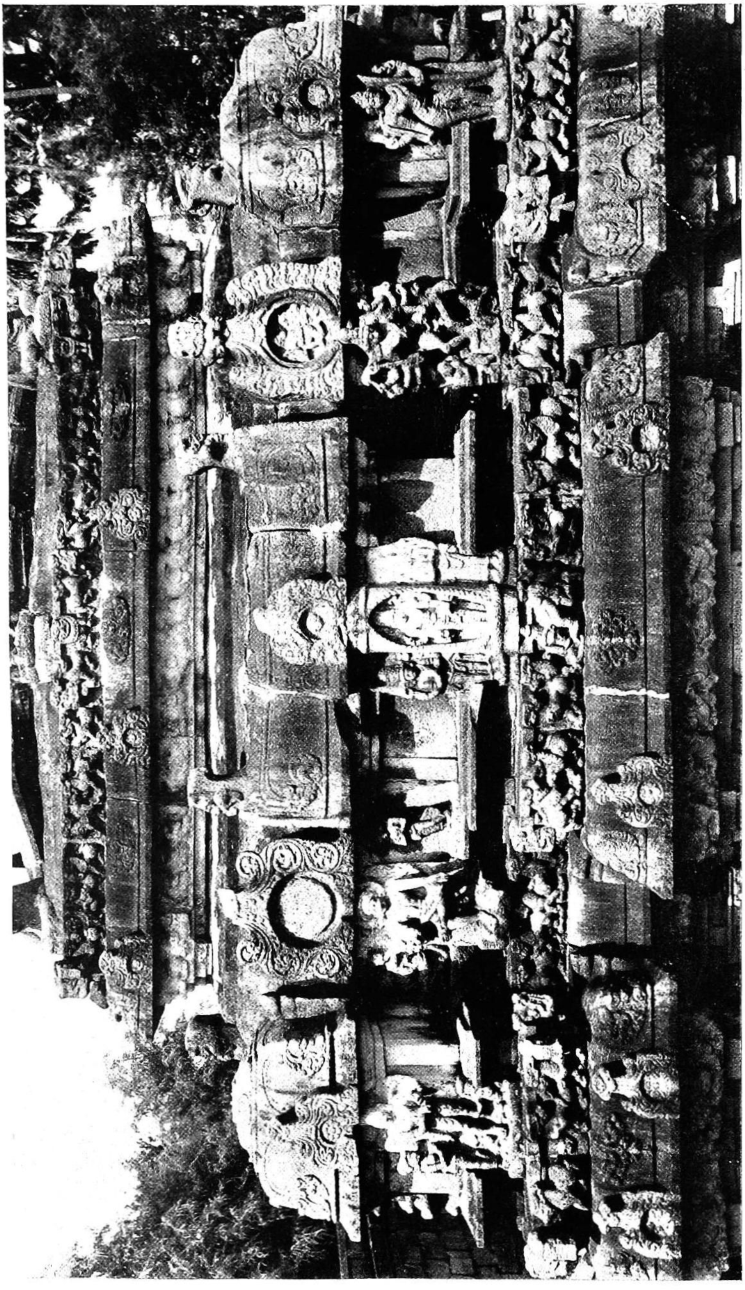


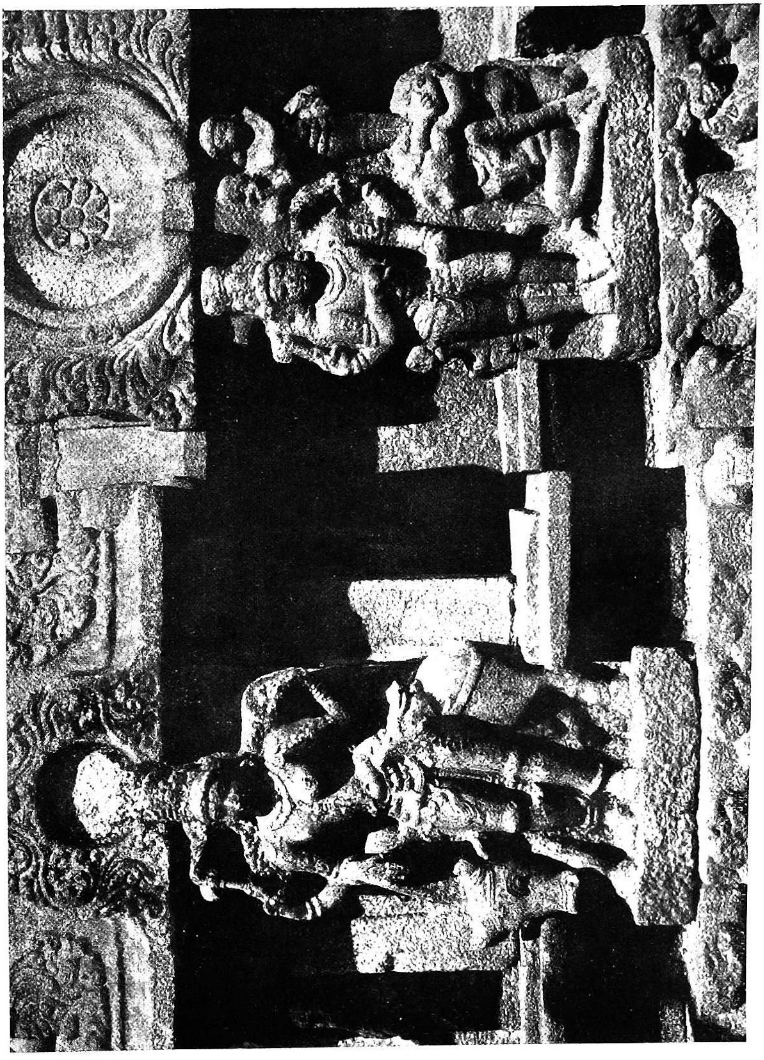
FIG. 2. Sculptures on the southern side, first storey, Tiruvālīśvaram

FIG. 1. Panels of *Umāprasādana*, and *Umā* and *S'iva* on southern side, Tiruvālīśvaram

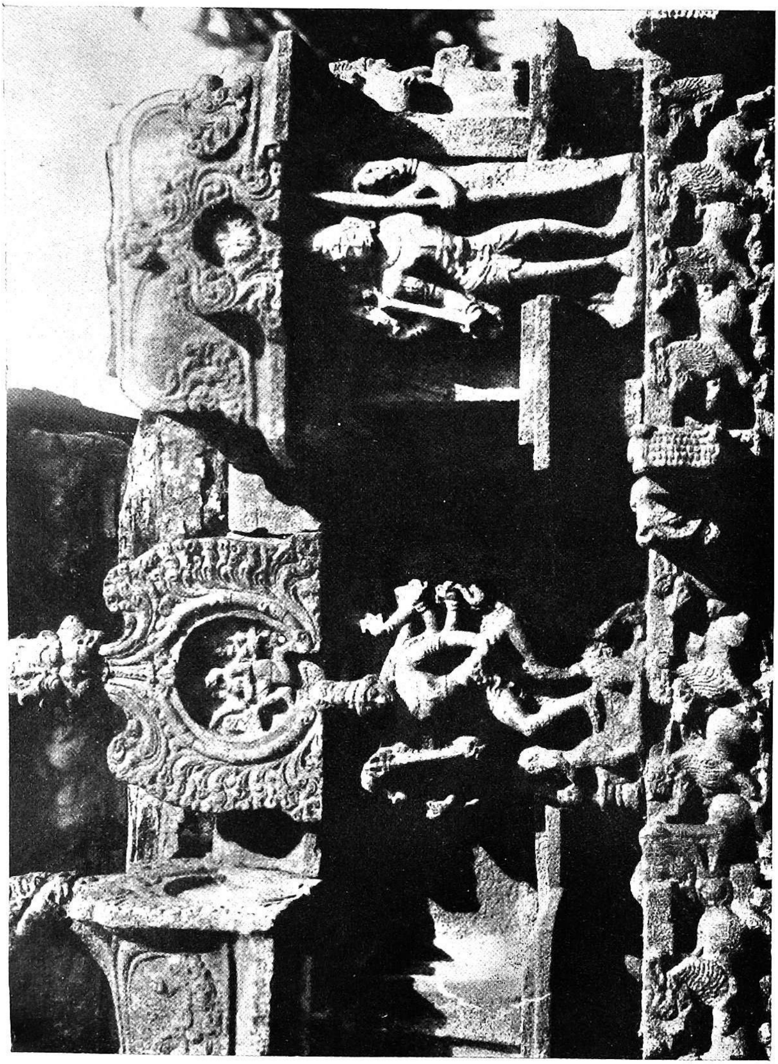
FIG. 2. *Naṭarāja* on southern side, Tiruvālīśvaram



Panels of *Dakṣayajña* and *Ardhanārīśvara*, on southern side, Tiruvālīśvaram



Panels of *Dakṣayajña* and *Ardhanārīśvara*, on southern side, Tiruvālīśvaram



Panels of *S'iva* as *Tripurāntaka* and *Kālāri*, respectively, on western side, Tiruvālīśvaram

Liṅgodbhava-mūrti, Tiruvālīśvaram

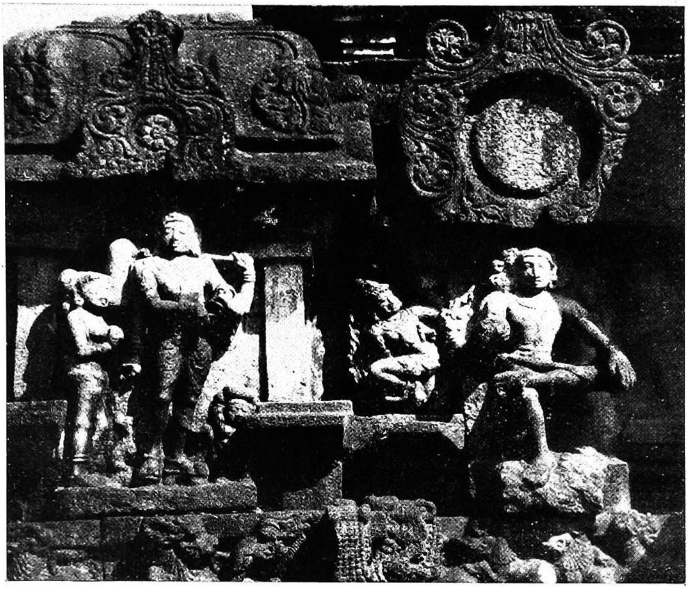


FIG. 1. *S'iva* as *Sukhāsīna* and *Bhikṣāṭana*, respectively, Tiruvālīśvaram

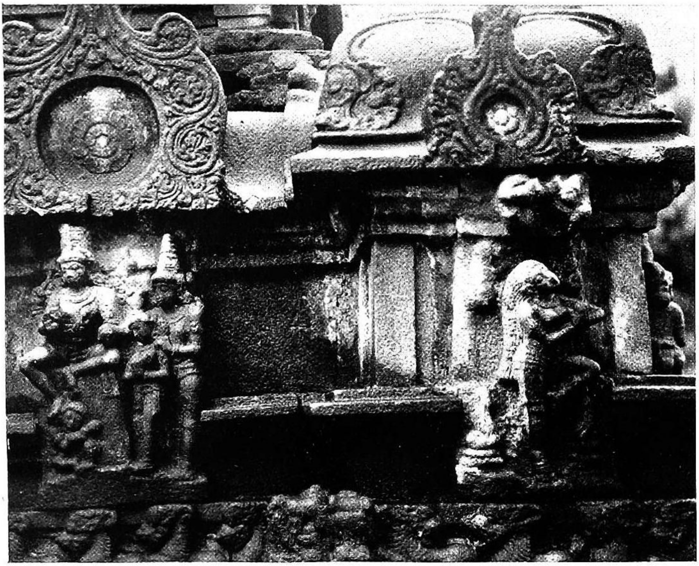


FIG. 2. *Pārvatī* in penance and marriage, respectively, Tiruvālīśvaram

FIG. 1. *Gajāntaka*, Tiruvālīśvaram

FIG. 2. *Dvārapālaka*, Tiruvālīśvaram

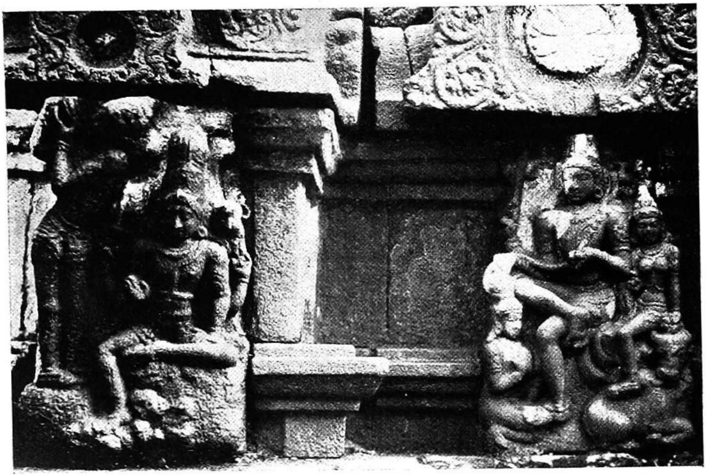


FIG. 1. *Chaṇḍeśānugraha-mūrti* and *S'iva* in *abhiṣeka*, Tiruvālīśvaram

FIG. 2. *Yōga-narasiṁha* on *grīvā*, Tiruvālīśvaram

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YĀDAVAPRAKĀŚA AND HIS COMMENTARY ON THE *CHANDAḤSŪTRA* OF PIṄGALA

By SIVAPRASAD BHATTACHARYYA

In modern days the *Chandaḥsūtra* of Piṅgala (the Vedāṅga *chandas*), as distinct from the later apocryphal *Prākṛta-Piṅgala*, has been a little read work.[1] The *śāstraic* and scientific manner of presentation, which from its inception, like that in the sister science, *vyākaraṇa*, it could not afford to leave out, the large proportion of the *sūtras* relating to the Vedic metres (a little more than one-third, or to be precise 107 out of the 288 *sūtras* in Yādavaprakāśa's text) and the incidental attention to the *pratyayas* (like *prastāra*, the multiplication of metrical specimens by the processes of permutation and combination, as well as *naṣṭa* and *uddiṣṭa*), which, though pertaining essentially to the classic metres, appeared like riddles and at their best were catechized in later treatises on the subject, if not given the go-by, have served as hard nuts to crack and as avoidable impediments to the later easy-going student, especially because he had to devote his energies to other important topics. From early times of memorable antiquity, devices were set on foot to shorten this course and the treatises[2] of Jayadeva, a Jaina systematizer of Piṅgala, who, however, leaves no item out of Piṅgala's original work, the synopses (*sāra*) in the *Agnipurāṇa* and the *Garuḍa-purāṇa*,[3] both, especially the latter, highly valued particularly by the late writer Bhāskara-rāya, author of the foremost and most voluminous works on the subject, as well as the *Prākṛata-Piṅgala*, which brought metres of the Vedāṅga *chandas* into a line with its ramifications in Prakrit *apabhraṁśa* and dialectal metres, have served in their own ways to make a business-like practical approach to the subject available within the reach of later-day students. The mediaeval standard works like the *Vṛttaratnākara* and the later easy manuals like the *Chandomañjarī* of the Orissan poet, Gaṅgādāsa, and the *Śrutabodha*, often, though wrongly, attributed to the prince of poets, Kālidāsa, showed which way the wind was blowing. In such circumstances the attention of the average scholar in literature could not be diverted to commentaries[4] on the Vedāṅga *chandas* of Piṅgala, which, as

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[1] The confusion of the *Prāk. Piṅg.* with the *Piñ. Ch. Sūt.* has been responsible for wrong entries in several *Des. Cat. of MSS.* by counting commentaries on the former as commentaries on the latter. Krishṇamachariyār in his *History of Classical Sanskrit Literature* (p. 891) has followed these *Des. Cat.* and has given a wrong account; e.g. commentaries by Vāṇīnātha and Śrīharṣa which are available in the Calcutta Sanskrit College MSS. collection (*Chandas*, Nos. 9 and 8) are on the *Prāk. Piṅg.* and not on Piṅgala's *Chandaḥsūtra*.

[2] *Jayadeva-Chandas* (pp. 1–40) in the *Jayadāman* ed. H. D. Velankar, Bombay, 1950.

[3] *Agnipur.*, Ch. 328–335 (Anand edn., Poona), *Garuḍapur.*, Ch. 211–216 (Vangavāsī edn., Calcutta).

[4] Over and above the three commentaries discussed here are those referred to by the popular commentator, Halāyudha, in the *Mṛt. Sañj.* (under IV. 52: अन्यै: पुनरन्यथैवेदं सूत्रमधीयते; VI. 18: केचिदिदं सूत्रं न्यायोपलक्षणपरं व्याचक्षते; VIII. 34: षष्ठप्रत्ययोऽध्वपरिच्छित्तिरित्येके) those by a वृत्तिकृत् (Y. P. and this वृत्तिकृत् agree in their views in very many cases). On f. 101*a* (regarding वृत्तिकाराणां तत्परित्यागः) noted by Bhāskararāya, f. 111*a* regarding him (अत्र द्विरादित्या इति वृत्तिकारादयः पेठुः) in the *Bhāṣyarāja*; and a

extant in MSS., or known from other commentaries that survived, are not more than ten at the best computation.

Yādavaprakāśa is one of such commentators, certainly not the earliest but one of the very earliest that are known. As a commentator on metrics he is not well known. About seventy years ago Professor Gustav Oppert mentioned Yādavaprakāśa's commentary, in his edition of the lexicon *Vaijayantī*, which is held in high esteem throughout South India. The *Catalogus Catalogorum* does not enter this work under Yādavaprakāśa, though it was compiled long after this edition. The absence of any recorded MSS. was the ostensible reason for this omission. The *Des. Cat. of MSS.* in the Oriental Library, Madras, of 1905 and later, the *Triennial Cat.* compiled under the same auspices note four MSS.,[1] three of which are in Telugu script and one in Devanagri script, which latter may not unlikely have been a transcript prepared on the basis of the three Telugu MSS. The Adyar Library MSS. collection has got a MSS. in Devanagri script.[2] The Sanskrit College, Calcutta,[3] also has got a MSS. in Devanagri. All these MSS., as described and known, are more or less defective, full of lacunae, because of the wide gap of time and of the mode of approach by the scribes, who copied the text from MSS. known to them.

Fortunately for the modern scholar, who has access to the source-books used by Yādavaprakāśa in his treatment of the Vedic metres, and to the Concordance of passages from the Vedas (where almost all of these are noticed), the *vedic* portion, which presented the greatest difficulty to the scribe, is restorable with a high degree of proficiency. We cannot be so sure of the classical portion, where the illustrations, of which we shall speak in a subsequent section, and the supplementary metrical extracts supplied by Yādavaprakāśa present considerable difficulty. Sometimes we have to resort to emendations, commensurate with the presented text for the purpose of hitting at the desired reading.

The well-known Yādavaprakāśa was the blessed (*bhagavat*) Y. P., the teacher of the *viśiṣṭādvaita* philosopher, Rāmānuja, to whom according to the tradition current, the latter resorted in Kāncī for instruction in Vedic and philosophic lore in the early part of the latter's life as a student. He is known to have been the author of two works, the *Vaijayantī*, the most popular lexicon in South India of the mediaeval period, as the numerous references thereto by commentators on *kāvyas* go to show, and the *Yati-dharmasamuccaya*, a digest in eleven sections (*parvans*) dealing with the *raison d'être* of the institution and the code of conduct of the *yatis*, or *sannyāsins*, people in the fourth stage of life according to the time-honoured divisions of the stages of life of a *varṇāśramin*. While the former work is available in print, the latter is known in MSS.[4] only and is often confused with a later manual, the *Yatidharmasaṅgraha* by the monk Viśveśvara Sarasvatī—a work which, in its sectional colophons and in some catalogues

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bhāṣya-kāra different from himself noted occasionally in the *Vṛttacandrodaya*, *vide* reference to the readings and expositions of the others, notably western, eastern and northern writers (*Bhāṣyarāja*, f. 101*b*, f. 108*a*, f. 129*a*), and *Kaustubha* different from his own work, *Chandaḥ-Kaustubha* frequently referred to in the latter work (e.g. f. 27*b*, f. 32*b*, f. 66*b*, f. 69*b*, f. 88*a*). This *Ch. Kaus.* seems to have been an exposition of the views of Piṅgala as in the *Piṅgala-Chandaḥ-Sūtra*.

1 D 905, D 906 and R 4271, all in Telugu script and D 15694 in Devanagari script.

2 Adyar: *Catalogue of MSS.*, Part II, p. 39, 9 I, 22.

3 MSS. *Chandas*, No. 22.

4 MSS. D 2949, D 2950, D 2951, D 2952, D 2953, D 2954, . . . D 16207 as well as R 3196(g) and R 4957(a) of *Mad. Or. Gov. MSS. Library*.

of MSS. including that in the Asiatic Society, Calcutta, is also named *Yatidharmasamuccaya.* Yādavaprakāśa's work is widely known and is used as an authoritative exposition by digest writers like Kamalākara Bhaṭṭa in his *Nirṇayasindhu* and has been summarized for the school as a handy practical manual.[1] It is almost certain that Y. P. wrote other works[2] including a few on the philosophy of the Upaniṣads and on its bearing on the *advaita* system, as references to, and refutation of, his views appear in the *Vedārthasaṅgraha*[3] of Rāmānuja, and as worthy commentators like Sudarśana Sūri would expect one to hold. There is a pointed mention in such references to his difference in approach and in the final view (*siddhānta*) from Rāmānuja, as well marked as those from his famous opponents, Śaṅkara and Bhāskara. Tradition records that out of such differences, as well as of the two other recorded examples of the exposition of the *Taitt. Upaniṣadic* passage (II. 1) *Satyam jñānam anantaṁ brahma* and of the phrase *Kapyāsam puṇḍarīkam* in the *Chāndogya Upaniṣad* (I. 6. 7) delivered in course of his first lessons from that *guru*, there sprang up a deadly hostility between the two, the curtain on which was drawn after some years of persecution aimed at the latter, by his acceptance of the religious tutelage of his erstwhile pupil Rāmānuja.

The commentary on Piṅgala's *Chandaḥsūtra* at the end of the colophons in all the chapters calls itself throughout as the work of the blessed Yādavaprakāśa (*bhagavato Yādavaprakāśasya kṛtau Piṅgalanāgacchandoviciti-bhāṣye . . . adhyāyaḥ*). At the end of the work there is a verse,[4] evidently of the commentator's composition, which states that the rules of metrics (*vṛttavidhi*) have been extracted (*ujjahre*) from the *Chandaḥśāstra* of Piṅgala, to define metres, the favourite (vehicles) of poets, by the good and wise Yādavaprakāśa, just as the code of conduct (*vṛttavidhi*), a word used with a *double entendre*, had been extracted for the self-controlled ones (*vaśin*), and put into a formal manual, by the same author from the recorded instructions of the eminent *yati* (*yativara*). This *yativara* in the above verse is compared to the *Piṅgala Ch. śāstra*, i.e. to Piṅgala. In our land every form of instruction, especially that bearing on *dharma*, must have to originate from a great teacher or a figure well known therefor in the Purāṇic tradition appearing as the systematizer of a *śāstra* (course of disciplinary instruction). Taking recourse to the first alternative sense, as a personal reference, one would like to regard him as the great Yāmunācārya, Alavandar, his *guru* and the *prācārya* of Rāmānuja, who is known by that

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[1] R 1634(a), *Mad. Or. Gov. MSS. Library.*

[2] The *Viṣṇusmṛtiṭīkā* assigned to him by some scholars may be a wrong ascription due to confusion in nomenclature. The commentary on *Viṣṇusmṛti* by Nandapaṇḍita is named as *Vaijayantī*, the name of the celebrated lexicon by Y. P.

[3] e.g. in p. 2 (in the commentary यादवप्रकाशमते सर्वमपि चेतनमेव . . . चिद्ब्रह्मणोरपि भेदाभेदौ स्वाभाविकौ), p. 16 (अन्ये पुनरैक्यावबोध . . . इति प्रत्यवतिष्ठन्ते' *vide* commentary, p. 99: तृतीयेऽपि पक्षे जीवब्रह्मणोर्भेदवदस्याप्युपगमात्, *vide* commentary: अथ यादवप्रकाशमतं निरस्यति तृतीयेऽपीति). The page references are to the Calcutta edn. as financed by Magniram Bangur, Cal. Vik. Sam., 1998.

[4] इति साधुना यतिवराद्वशिनामिव यादवप्रकाशेन। कविदयितानां पिङ्गलशास्त्राद्वृत्तविधिरुज्जह्रे॥ The Adyar MSS. reads the verse a bit differently. साधु = wise (सन् साधुः कोविदो बुधः) and gentle or noble. In the *Vaijayantī* it is stated at the end: इति यतिवरसङ्घपूजिताङ्घ्रिः प्रथितयशा भुवि यादवप्रकाशः। व्यरचयदभिधानशास्त्रमेतत् . . .॥

name as the great *muni* (*yatīśvara*)[1] in the school. The more probable explanation, considered from the relevance of the simile, lies in choosing the second alternative sense, by which, from references in the prevalent works on the subject, *yativara* becomes equated with the great Dattātreya, who in Upaniṣadic[2] and Paurāṇic accounts[3] is described as the *yati*, who gave form and expression to this *śāstra*, in a manner available in the *Dattātreyasaṃhitā*[4] which has presumably been the model for Y. P.'s work and other allied works. The number of citations from him in such works and the appositeness of comparing a *śāstra* with the established canons of long continuity would rule out perforce the other explanation and vindicate such an interpretation of the verse as the just one. The other work, ascribed to Y. P., the *Vaijayantī*, compared with later lexicons, contains a fairly large number of words which are peculiar[5] to Vedic literature, evincing the inherent bias of the author in that line, which would serve to connect the *bhāṣya* on Piṅgala's work in a kinship.

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[1] श्रुतिन्यायापेतं जगति विततं मोहनमिदं तमो येनापास्तं स हि विजयते यामुनमुनिः॥ (intro. ver. 2 cd). One यतीश्वर is found in the list of Viśiṣṭādvaita teachers noted in that work (*vide* the *Pandit* edn., 1924, reprint, p. 154): व्यास-बोधायन-गुहदेव-भारुचि-ब्रह्मनन्दि-द्रमिडाचार्य-श्रीपराङ्कुश-नाथमुनि-यतीश्वरप्रभृतीनां मतानुसारेण). यामुनाचार्य्य is the grandson of नाथमुनि, the *ācārya* of यादवप्रकाश and the *prācārya* of रामानुज. The यतिवर of footnote 4 (p. 2) may be deemed as a source of his knowledge on यतिधर्म्म in the sense that the lessons on the *Dattātreyasaṁhitā* and the information therein came from him.

[2] नमो भगवते दत्तात्रेयाय... बालोन्मत्तपिशाचवेषाय... महायोगिनेऽवधूताय (*Dattātreyopaniṣad*); तत्र परमहंसा नाम संवर्त्तकारुणि... दत्तात्रेय... प्रभृतयः (*Bṛhajjābālopaniṣad*); तस्मिन् समये निदाघजडभरतदत्तात्रेय... वशिष्ठपिप्पलादयश्च... यतयः (*Rudrākṣajābālopaniṣad*).

[3] e.g. in the *Mārkaṇḍeya Purāṇa*, Ch. 41, 20–26 (योगिमाहात्म्य) as the teachings of Dattātreya; *Bhāg. Pur.*, II. 7.4 (अत्रेरपत्यमभि... भगवान् स दत्तः यत्पादपङ्कजपरागपवित्रदेहाः।... योगर्धिमापुरुभयीं यदुहैहयाद्याः॥) VI. 8.16 (मामुग्रधर्माद... पातु। दत्तस्त्वयोगादथ योगनाथः...॥)

[4] *Mad. Or. Gov. MSS. Library*, D 2947 (*Dattātreyasaṃhitā* on यतिधर्म्म) in 13 chapters divided as (i) चूर्णयाग, (ii) संस्कारविधि, (iii) यत्यूर्ध्वक्रियाविधि, (iv–v) देशान्तरमृतयतिपुनःसंस्कारविधि, (vi–vii) यतिपार्वणविधि, (viii) परमेष्ठिकल्पविधि, (ix) यतिगतिकर्मविधि, (x–xii) यतिवर्ज्यकर्मनिरूपण and (xiii) यत्यादिपुत्रकृत्यनिरूपण; and D No. 2850 (*Yatidharmasamuccaya*) in 11 *parvans* divided as (i) पारिव्राज्यविधि, (ii) अधिकारिदशानिरूपण, (iii) लिंगनिरूपण, (iv) सन्न्यासप्रयोग, (v) मुख्यविधि, (vi) आहारादिक्रिया, (vii) आचार, (viii) प्रायश्चित्तविधि, (ix) गतिस्थितिनिर्णय, (x) प्रायश्चित्तादिकृत्य, (xi) यतिसंस्कारविधि. This work begins thus: सन्न्यासविषयाः सर्वाः समाहृत्य श्रुतिस्मृतीः। क्रियते यादवेनायं यतिधर्मसमुच्चयः॥

[5] 'Another distinct feature of the *Vaijayantī* is that it contains the most important words of the sacred as well as of the secular literature in Sanskrit' (G. Oppert's Preface, p. 1). Among such we find अनुवाक, खिल, उपखिल, आसन्दी, अहिनिर्ल्वयनी, उद्दाम (=वरुण), संयाव, जागृवि, प्रपाठक, शाखारण्ड, कुल्माष, रथ्येघ्न; मनोजवा (one of the seven flames of fire), उदुम्बरायण, ज्योक् (indeclinable) and साङ्करि (=अग्नि). Bhāskararāya, the other important commentator on *Piṅ. Ch. Sūt.*, it may be noted incidentally, wrote a *Vaidikakoṣa* which was published from Bombay several years ago.

The *Vaijayantī* registers 21 metres as *chandas*,[1] diverging from the mode of Amarasiṁha (and his followers in lexicography) who would count them as seven. The antiquated mode of reference for Vedic works[2] by such terms as *śākhāntara*, a form used by Uvaṭa in his commentaries known to students of mediaeval texts like those of Śaṅkara, Rāmānuja and Madhva to designate works, not necessarily of the same Vedic *saṁhitā* but works of other Vedas as well, the *brāhmaṇas*, terms like *brāhmaṇavāda* (statements in the well-known texts known as the *Brāhmaṇas*), *vaidika ślokas* (referring to verses in works of the Vedic *sūtra* period like the *Nidānasūtra*), to the *bahvṛcas* and *chāndogas*, to *dāśatayī*, and *sāmayoni*; the authoritative mention of the *Vārṣagaṇyas* (under III. 12) and the *Āhvaraśākha* (under III. 15), names forgotten even in mediaeval parlance, the frequent citations from Vedic *Brāhmaṇa* and *sūtra* texts, in support of the position of the author Piṅgala, who is designated by the epithet *ācārya*, the wide use of technical terms[2] familiar to Vedic scholars like *stotra*, *śāstra*, *yājyā*, *annuvākyā*, *anukramaṇī* and *sampad*, and occasionally of such in verbal forms (*śasyante*, *anūcya*, *anukramya*, *sampadyante*) as well, and the indulgence in archaic and elliptic forms of expression[3] in the commentary are symptomatic not merely of Vedic scholarship but also betray an inclination to old fashions, which characterize the writer and serve to determine his antiquity. Rāmānuja belongs certainly to the eleventh century. A.D. 1017–1137 is the life period assigned to him in the tradition of the school, and his teacher, Y. P., in his early life must have therefore lived between the fourth quarter of the tenth and the middle of the eleventh century. The well-known commentator on the *Ch. sūtras*, the *vṛttikṛt* Halāyudha who from his panegyric verses used as illustrations must be inferred to have lived in the time of king Muñja, the uncle and predecessor of king Bhoja, i.e. near about the last quarter of the tenth century, has no such preferences or inclinations and his commentary on the Vedic portion is only an easy rendering of the *sūtras*.

The third great annotator is the great scholar-prodigy, Bhāskararāya, author of more than fifty works, four of which (leaving out the amphibious polemic *Vādakutūhala*, conceived in the spirit of a *mīmaṁsaka*, eight sections of which, according to his own assertion, relate to metres) are on metrics.[4]

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1 *Gāyatrīpramukham chhandaḥ* (*Amarakoṣa*), *Chhandobhedāstu gāyatrīpramukhā ekaviṁśatīḥ* (*Vaij.*, p. 85): *Vaij.*, p. 236 वृत्तं स्वरूपे वृत्ते is important in this connection, *vide* f.n. 12, f.n. 37 and f.n. 41, as वृत्ति in Y. P.'s commentary is often used as a synonym for वृत्त (metres).

2 These terms are found also in Uvaṭa's commentary on the *Ṛk. Prātiśākhya* written in Ujjayinī under king Bhoja (*Ṛṣyādīṁśca namaskṛityojjayinyāmuvaṭo vasan mantrāṇām kṛtavān bhāṣyaṁ mahīṁ bhoje praśāsati*, i.e. about the first quarter of the eleventh century A.D.). The influence of the one over the other is not ruled out. From the life period inferred from the records of the Rāmānuja sect, it is likely that Y. P. is the later of the two.

3 e.g. स चेत् प्रयुज्यते द्वयोर्मात्रयोः स्थाने स्यात् (under I. 13); साम्नां गायत्र्याः संख्या तु द्वौ द्वौ वर्णौ वर्धेत अन्यानि छन्दांसि सम्पद्यन्ते (under II. 9); बार्हतमिति तृचं सतोबृहतीत्याचक्षत इति छन्दोगाः (under III. 36); तामेतां विषमपदेति बह्वृचाः (under III. 55); तामेतामुष्णिग्गर्भेति-बह्वृचाः (under III. 56); अथ सुप्रतिष्ठायां त्रयोदश वृत्तम्—उदाहरणानि। and वारेण भृगोः (under V.8).

4 *Vṛ. Can. Ud.* (III.C 94), *Bhāṣyarāja* (III.A 177 of the Society collection), the *Ch. Kaus.* and the *Mṛta-(san)jīvanī*. The *Bhāskaravilāsakāvya* (life-account of Bhāskararāya) notes one more *Vārttikarāja*, not separately mentioned by Bhāskara himself probably because it was a part of the *Bhāṣyarāja* or of the *Vṛ. Can. Ud.* both of which contain *vārttikas* as supplementary matter, or because it was somebody else's composition like the *Chotī Vṛtti* noted there.

Two of them, the *Vṛttacandrodaya*, the biggest known dissertation on the subject, in *eighteen thousand granthas*, and the *Bhāṣyarāja* on Piṅgala's *Chandaḥsūtra*, have direct relation to Piṅgala's work. Both the latter works are available in full in MSS. in the Society collection of Sanskrit MSS. of the Asiatic Society, Calcutta. Bhāskararāya seems to refer to Y. P. as *prāncaḥ, vṛddhāḥ*, the old scholar,[1] a term indicating respectable antiquity. But while Bhāskararāya has used Halāyudha's *vṛtti* profusely in both of his works, he has made a meagre use of Y. P.'s work and this is easily explained. Bhāskararāya is an elaborate and finished debater, or, to be more pointed, he likes to present himself as the challenger of the views of others, including even minor writers who do not deserve such a scrutiny in treatment. Y. P. is a sober, sedate and dignified writer, bent on helping his readers with a short, lucid and practical exposition and presents his notes in a manner that does not conduce to controversy. He minimizes differences by noting the *siddhānta* of the *ācārya*[2] as such in the Vedic portion and supplements information for the classical literature portion by the pithy expression *api ca*. Even when he stresses one particular view, e.g. in connection with his exposition[3] of the genera *samānī*, *pramāṇī* and *vitāna* (V. 6, 7, 8) and of the *gāthā* (VIII. 1), on all of which topics a keen controversy has subsequently raged, his manner is so convincing that it disarms all criticism. In these specific cases Bhāskararāya queerly enough does not fight with him, even though his views are often fundamentally different. He uses two verses, the first and the fourth (last) verses in Y. P.'s introduction to his commentary. Though all the four verses apparently overlap Piṅgala's *sūtra* text (Y. P.'s intro. v. 1–2 and *Ch. sū.* I. 1–11), they are meant as appreciative eulogy of Piṅgala's work and method, the first especially as an indirect way of seeking the grace of Śiva,[4] who is noted as the pioneer of the *śāstra* at the end of Y. P.'s commentary. Bhāskararāya uses them to

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[1] *Vṛ. Can. Ud.* (f. 31b): *Prāncastudīrgham saṁyogaparaṁ tathā plutam vyañjanāntamūṣmāntaṁ. Sānusvāraṁ ca guruṁ kvacidavasānépi laghuvantyaṁ*, and *Vṛ. Can. Ud.* (f. 48a) and *Bhāṣyarāja* (f. 58b, 59a): *Yatha mayarasatajabhanalagasammitaṁ bhramati vaṅmayaṁ jagati yasyeti keṣāncichchhloke.*

[2] cf. *Jayd. Ch.* I. 4 वान्तेग्वक्रः; I. 5 संयोगादिपरः; I. 9 विरामो यतिरिति and Y. P. intr. V. 4: दीर्घं संयोगपरम् . . . and on I. 10: ननु यद्यन्ते क्रियमाणा गुरुसंज्ञका एव कथं गौत्यार्यादीनां लघ्वन्ततया विधानं तर्हि तत्र लघुसंज्ञाऽपीष्यते; on I. 11: हकारादौ तु संयोगपरतः क्वचित् पूर्वस्य गुरुत्वं क्वचित्तु न गुरुत्वं दृश्यते यथा . . .; on VI. 1: तद्यथा—यतिः पाठविलम्बोऽसौ भागोऽर्धे सन्धिपाठयोः। . . . उपसर्गेऽपि कुर्वीत पादस्यार्धान्तयोर्यतिः। . . . यथाशोभं यतिः . . . कार्या . . . ॥

[3] *Ibid.*, V. 6: सर्वेषु छन्दःसु युग्मसंख्येषु चतुरक्षर-षड़क्षर-प्रभृतिषु गुरुर्लघुः पुनर्गुरुः पुनर्लघुरित्यादि छन्दसोऽक्षरसंख्यासमाप्तेरावृत्तौ समानी नाम वृत्तं भवति। . . . अत्र समानीति सामान्यार्थां सत्यामपि संज्ञायां क्वचिद्विशेषसंज्ञाऽप्यस्ति। तद्यथा उष्णिहि समानी विभूतिः, जगत्यां विभावरी . . .। V. 7: लघुर्गुरुः पुनर्लघुः पुनर्गुरुरिति लघूपक्रमा चेदावृत्तिः प्रमाणी नाम वृत्तं भवति . . . अष्ट्यां पञ्चचामरमभिक्षतौ गभस्तिमालिकेति। V. 8: आभ्यां समानीप्रमाणीभ्यामन्यत् सर्वं वृत्तजातं वितानसंज्ञं वेदितव्यम्। (This is also the view of the *Jānaśr. Ch. Vic.* (II. 3–5); VIII. 6: अत्रासिद्धं गाथा। सिद्धं छन्दोलक्षणम्। यत् पुनरस्मिन् तन्त्रे पूर्वैः सूत्रैर्वक्ष्यमाणैर्वा प्रत्ययैरसिद्धं तद् गाथासंज्ञं वेदितव्यम्।

[4] *Sa jayati piṅgalanāgaḥ śivaprasādādviśuddhamatiḥ*, and *Vṛ. Can. Ud.*, f. 490b: *granthaḥ Ṣoḍaśyambāprasādataḥ pūrṇaḥ* and *Bhāṣyarāja*, f. 132b: *iti śrīśāradopāstilabdhāsīrdīkṣitōsnicit . . . chhandojñānamidaṁ bhavādbhagavato lebhe surāṇāṁgurustasmādduścyavanastatōsuragururmāṇḍavyanāmā tataḥ. māṇḍavyādapi saitavo munivaro rātastataḥ piṅgalastasyedaṁ yaśasā gurorbhuvi dhṛtaṁ prāpyāsmadādyaiḥ kramāt.*

explain the position of the *śāstrakāra's* ruling on relevant points (*śastra-sthiti*) and has remarks which are in no way derogatory to the great commentator, whom he acknowledges as *prancaḥ* (an old scholar).

The present-day student of Piṅgala's work meets with these two verses (rather all the four verses) in the introduction by Y. P. in his commentary in all the printed editions of Halāyudha's *vṛtti* (except in one, the *Bib. Ind.* edn., Calcutta, 1871), and is perplexed. In a MSS. (Madras Or. MSS. Lib., D 901) thereof both these verses are also met with where, however, the editor's note[1] sets matters right. None of the MSS. of Halāyudha's *vṛtti*, consulted by us, contains these verses. Bhāskararāya's ascription of them to *prancāḥ* (old writers) and not to Halāyudha . . . . (*vṛtti-kṛt*), whom he has cited very frequently in his works, settles the question. By no stretch of imagination can they be regarded as part of Piṅgala's *sūtra* work either. The wording of the first verse (*jayati Piṅgalanāgaḥ*), and the absence of any commentary on these verses, which, as we have already noted, cover the ground trodden over by his *sūtras*, leads also to this conclusion. Moreover, no *sūtrakāra* of repute can ever have the foolishness to indulge in such self-praise. The practice among a certain section of Deccan Brahmins, to which Mm. Kane refers, in his *History of Dharmaśāstra*, of citing the first of these verses (*mayarasatajabhanalagasammitam . . .*), the symbols arranged exactly in the order in Piṅgala's work, where they are first noted (I. 1–10) during the annual Vedic *upākarman* ceremony presumably as an earnest indication of the beginning of the *vedāṅga chandas*[2] meaning thereby that it is a part and parcel of Piṅgala's work is, therefore, based on a wrong supposition and may have come into vogue rather late. This is proved by the faultiness of the symbolic and technical names of other departments too (e.g. in grammar where Pāṇini's *Aṣṭādhyāyī* may be noted as the source-book).

There arises, therefore, the consideration of the primary requisite of a scrupulously conceived commentary, especially in the case of an early work, *viz.* that of presenting a faultless text. Y. P. is, on this as well as on other grounds, a more faithful commentator than anybody else, particularly Halāyudha. Halāyudha has left out certain *sūtras*, e.g. IV. 8 in Y. P.'s[3] presentation, in the Vedic portion, which is read as one *sūtra* by Y. P., as three *sūtras* by Bhāskararāya in his *Bhāṣyarāja*[4] and as five *sūtras*[5] by Sadguruśiṣya in his commentary on the *Ṛk. v. sarv. anu* of Kātyāyana (the division being *uktam sā'ti* | *madhyam* | *pratiṣṭhā su ca* in Bhāskararāya's presentation and *uktam* | *sāti* | *madhyam* | *pratiṣṭha* | *su ca* in Sadguruśiṣya's reference)[5], VI. 16 *ekarūpam sau jagau gaḥ*[6] and VI. 38 (*śaśapluta*). He has mentioned certain *sūtras* as being doubtful (III. 65, III. 66 and VIII. 14 in

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1 *Ibid.* on D 901: 'The stanzas in the beginning seem to be taken from the commentary by Y. P.'

2 Vol. II, p. 703, f.n. 1684: छन्दः—मयरस . . . इति; c.f. *Nid. Sūt. Ch. Vic. Ṭīkā*: याः षट्पिङ्गलनागाद्यैश्छन्दोविचितयः कृताः। तासां पिङ्गलनागीया सर्वसाधारणी भवेत्॥ and *Vṛ. Can. Ud*, f. 8*a*–8*b*: छन्दःसूत्राणामनेकत्वेऽपि शिष्टैस्त्रैवर्णिकैर्ब्रह्मयज्ञादौ पिङ्गलस्यैव परिग्रहात् चतुर्वेदांगत्वम्। One Cal. Sanskrit Coll. MSS. of *Piṅg. Ch. Sū.* (*mūla*) (*Chhandas* No. 6) reads the verse मयरस . . . at the very beginning of the text, though it does not count it among *sūtras*, which are numbered in the MSS.

3 IV. 8: *uktaṁ sāti madhyaṁ pratiṣṭhā su cha imānyūnyāni pañca chhandāṁsi.*

4 *Bhāṣyarāja*, f. 51*a*: *etāni sūtrāṇi vrittikṛtā vismṛtāni.*

5 As in p. 76 (ed. by Macdonell, Oxford, 1899).

6 Y. P. reads it as the first *sūtra* on 11-syllabled metres. Some (*vide* Weber: *Indisch Studien*, VIII. p. 390) including Bhāskararāya in the *Bhāṣyarāja* read it as the last *sūtra* on 10-syllabled metres.

Y. P.'s text) which[1] are acknowledged by all as of Piṅgala. On the contrary, he has admitted certain *sūtras* (e.g. *vāhinī* between VI. 39 and VI. 40 of Y. P. and *vilāsinī* before VI. 27 of Y. P.'s text) and added eighteen *sūtras* all in a series (in VIII. 2–19 in his numbering) which did not form part of the original *sūtra* work. Bhāskararāya in his almost desperate attempt to make up the round number of three hundred,[2] which he ascribes to Piṅgala on an alleged tradition amongst authorities on the subject, has accepted certain *sūtras*, some on the basis of the tradition enshrined in the *Agnipurāṇa* and especially in the *Garuḍapurāṇa* and certain more not counted by them which are doubtful and about some of which he is not himself very sure. Besides, the order of arrangement of the *sūtras*, especially in the Vedic portion in Y. P. (e.g. III. 11–19 and III. 65–68), is not the same in other commentaries. In this matter we may safely follow the *Ch. viciti* (recently published from West Germany) and the *Jayadeva Chandas* in preference to the two Purāṇa texts which appear to be later and on which latter works Bhāskararāya places implicit confidence. There are some minor divergences[3] in the readings of the *sūtras* in Y. P.'s text from those in Halāyudha's, including differences in nomenclature[4] of the metres—and here we are not counting the faulty readings perpetrated by the editors of Halāyudha's text as printed. In almost all these cases Y. P.'s readings are unexceptionable. One such reading is in VIII. 1 (*atrāsiddham gāthā*) where Halāyudha and later writers like Kedārabhaṭṭa choose to read *atrānuktam gāthā*. Older authorities[5]—as Jayadeva (VII. 36) and Medhātithi, the commentator on the *Manusaṃhītā* (IX. 42), as we have noted in *Jottings on Sanskrit Metrics* published in *Our Heritage* (Vol. VII. 2 and Vol. VIII. 2), sanction Y. P.'s reading.

The ten opening *sūtras* of Piṅgala's work (known as *daśasūtrī* in scholastic circles), like the opening *sūtras* defining *guṇa*, *vṛddhi*, etc., in the *Aṣṭādhyāyī* of Paṇini, have been explained differently by various commentators from the standpoint of their bearing on the *śāstra* in general. Mediaeval commentators on this work starting from Halāyudha, as well as those on the later popular *nibandha* texts like the *Vṛttaratnākara*, have spent their time and energy in explaining their auspicious aspect (*maṅgalārtha*), i.e. with an eye to *phalaśruti*, the alleged theological bearing on the subject in the *paurāṇic* fashion. Bhāskararāya has in his *Bhāṣyarāja* struck on a new

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[1] *atra rocanābhāḥ kṛtayaḥ śyāvānyaticchandāṁsītyadhīyate chhāndogaḥ* . . . for which Halāyudha is criticised by Bhāskararāya in the *Bhāṣyarāja* (f. 45*a*–45*b*): *caramasūtradvyaṁ na kartavyaṁ iti vṛttikṛtām pramādaḥ.*

[2] *Bhāṣyarāja* (f. 132*a*): वाक्यसिन्धुरपारोऽपि छन्दःसूत्रशतैस्त्रिभिः। येन बद्धो नमस्तस्मै पिङ्गलाद्भुतशिल्पिने ॥ Y. P. has 288 *sūtras*, 15 in Ch. I.16 in Ch. II.68 in Ch. III. 54 in Ch. IV.42 in Ch. V.42 in Ch. VI.35 in Ch. VII.16 in Ch. VIII. The Cal. Sanskrit College MSS. (*Chandas* No. 6) has 297 and Halāyudha has 308.

[3] e.g. III. 13: विपरीतौ वाराह्यौ, Halāyudha reads विपरीता वाराह्यौ; III. 15: विपरीतौ प्रतिष्ठा, H. reads विपरीता प्रतिष्ठा; III. 66: सितसारंगपिशंगकृष्णलोहित . . . गौरा वर्णाः, H. reads सितसारंगपिशंगनील . . .; VI. 41: कान्तोत्पीडा . . . स्मौ समुद्रवसवः (Y. P.), H. leaves out समुद्रवसवः and notes अत्र पादान्ते यतिः।

[4] e.g. Y. P. IV. 40 प्रवर्त्तक which H. reads प्रवृत्तक; VI. 7: भुजंगशिशुसृता, H. reads भुजंगशिशुभृता; Y. P. VI. 37: हिमविकरा which H. and others read as कुसुमविचित्रा; Y. P. VII. 25: भद्रक which H. reads as मद्रक, the *Agnipurāṇa* as समुद्रक।

[5] *The Garuḍapurāṇa* (Ch. 335.1) which on its own assertion is a summary of Piṅgala's work, however, reads छन्दोऽत्रासिद्धं गाथा स्यात्।

note in his bold but ingenious approach to unfold their ulterior objective and has taken a bid to remove the thorns of wrong interpretations (*daśa-sūtrīvilaprotam-asatvyākhyānakaṇṭakaṁ*).[1] Our old commentator (Y. P.) has provided a novel perspective for looking into them at the end of his commentary on the first chapter, which fits in admirably with the Vedic inception of the science as well as with the treatment of his subject-matter by the *sūtrakāra* himself, a form of approach found in other *śāstras* (e.g. *Alaṁkāra*) as well. The ten *sūtras* point at the efficacy of a grounding in the ten categories (*padārthas*), viz. metrical units (*gaṇas*), appellations (*samjñā*), the process of resolution—the division of the conjunctive syllables (*vikarṣa, sampad*)—the deity (*devatā*), musical notes (*svara*), the clans of the important Vedic *ṛṣis* (*gotra*), the colours (*varṇa*), the differentiation of short and long vowels (*gurulaghusañjnāna*), the division into the three (*sama, ardhasama, viṣama*) classes of metres, and the caesura (*yati*). While the first two and the last three have strict relevance to classic metres, the other five pertain characteristically to Vedic metrics; and these cover the entire body of the *sūtra* work. The six *mātrās* in the wording of the opening *sūtra* (I. 1) of the work point, according to Y. P., to the six *pratyayas* treated in the last chapter. Bharata in his *Nāṭyaśāstra* also has noted ten fundamental requisites in the understanding of the *modus operandi* of metres (*chando-gatavidhi*), which are, however, explained in their relevance to the drama by his commentator Abhinavagupta.[2] The incidence of the number ten has an aptness in the case of Piṅgala's work which invites attention.[3]

The commentary on the strictly Vedic portion covers a little less than one-third of the entire work and the numbering of *sūtras* just agrees with that proportion (92 out of a total of 288 *sūtras*). It is lucid and informative to a degree and may well be used as a safe companion to the study of the Vedic *chandas* literature as any other commentary (*bhāṣyāntara*) in Vedic parlance as well as on the *prātiśakhyas* on strictly Vedic lines. Y. P. has put forward a strong brief for the *ācārya* Piṅgala as the expositor of the *vedāṅga chandas* and not as a summarizer thereof, emphasizing that the apparent omissions and oversights, in reality, do not matter (e.g. remarks in his commentary on III. 6 *ācāryeṇa tu....... vyabhicārasyāpi darśanāt*; on III. 48 *padapanktayo gāyatrīviśeṣāḥ, iti bahvṛcah, panktiviśeṣa eva brāhma-ṇavādebhya ityācāryāḥ, tathā ca brāhmaṇavādāh . . .*). This has been possible because of his thorough and systematic use of *Saṁhitā* and *Brāhmaṇa* literature and not merely of the Vedic *sūtra* manuals, especially the *Rk. prātiśākhya*, the *Anukramaṇis* of Śaunaka and Kātyāyana and the *Nidānasūtra* attached to the *Sāmaveda*, and the *Bṛhat-sarvānukrama-ṇīsūtra* of the Ātharvanas. It has rendered superfluous works like the

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[1] f. 2*a*: श्रीदाचीसरसीगर्भं कन्दं पिङ्गलनालकम्।... दशसूत्रीविलप्रोतमसद्व्याख्यानकण्टकम्॥ बुधपित्राऽपि दुर्बोधं छन्दःशास्त्रारविन्दकम्।... कोरकीभूय निद्राणं बोधयत्यद्य भास्करः॥

[2] *Nāṭ. Śās.* (G.O.S. edn., Vol. II. Ch. XIV. 102): *sampadvirāmapādāścha devatā-sthānamakṣaram. varṇaḥ svaro vidhirvṛttamiti chhandogato vidhiḥ* || and the *Abh. bh.* thereon: *sampaditi ... śrutāveva sambhavo na kāvya iti tātparyam. etannirūpaṇantū-payujyate yatra vedavākyasadṛśaṁ vākyaṁ nirṇīyate yathābhijñānaśakuntale.*

[3] The Cal. Sanskrit Coll. MSS. (*Chandas* No. 6) of Piṅgala *Chan. Sūt.* puts this nicely: त्रिविरामं दशवर्णं षण्मात्रमुवाच पिङ्गलः सूत्रे। छन्दोवर्गपदार्थप्रत्ययबोधाय शास्त्रादौ॥ This is a gist of Y. P.'s commentary on I. 15 (*dhīśrīstrīmityādimaṁ sūtraṁ . . . prastarādīn ṣaṭ pratyayāniti*) which has been referred to above in details in Y. P.'s commentary on I. 15: ... यत् त्रिविरामं तेन त्रीन् छन्दोवर्गान् प्रतिपाद्यान् सूचयति छग्जातिवर्गं मात्राजातिवर्गं वृत्तजातिवर्गं चेति। यद्दशवर्णं तेन दशपदार्थान् गणान् संज्ञाः सम्पदं देवताः स्वरान् गोत्राणि, वर्णान् गुरुलघुविज्ञानं विषमार्धसमसमसंज्ञां यतिश्च। यत् षण्मात्रं तेन प्रस्तारादीन् षट् प्रत्ययानिति।

learned commentary on the *chandas* portion by Sadguruśiṣya on Kātyāyana's *Sarvānukramaṇī* (Rv.), which was composed about two centuries later and which was utilized by the next, though very late, commentator on Piṅgala already noted. The illustrations given by Y. P. are copious and are explained by helpful, though terse, comments[1] which often evince his manifold attainments. Halāyudha has not provided illustrations—the *Bib. Ind.* edn. and old MSS. of his work are evidences therefor—though printed editions have been bold enough to supply them, maybe on the basis of notes appended at top and bottom of certain MSS. that were consulted by them.

The significance of the *role* of metres in Vedic paraphernalia (II. 16), the suggestive analysis of the process of *vikarṣa* or *svarabhakti* (III. 2), sequel to the idea of the manifold conception of *svara* in Vedic phonetics, the processes of contraction (*pratikrama*) and expansion (*abhikrama*)[2] incidental to Vedic formulation of metres with reference to the number of syllables, the conception of *vṛtti* in its two forms, the *laghuvṛtti* and the *guruvṛtti* as depending on the shortness and length of vowels in the structure[3] of a Vedic metre, particularly of the *anuṣṭubh, triṣṭubh* and *jagatī*, and their conscious application by the Vedic *ṛṣis*, a very important feature almost lost sight of by the modern scholars, especially of the West, in their statistical analysis of the emphasis on such in the light of the variations in cadence which are sought to be explained away, their division into the basic metres, the *atichandas* (long metres), and the rare varieties like *kṛti*, the occasional, rather rare, operation of the process[4] of *adhyāsa* (appendage) and the acquiescence in the theory of metres having a varying number of feet (with proper illustrations) commencing from one to six, both of which contingencies[5] have been especially marked in Prakrit and Apabhraṁśa metrics, the

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[1] Under III. 7: तत्र गायत्र्येकपदा . . . । इन्द्रो विश्वस्य गोपतिरिति चतस्रः सूत्रे पठिताः। अथ द्विपदा। पवस्व सोमम् . . . इति तिस्रः।; III. 16: क्वचिन्नवकचतुर्दशाभ्यां जगती द्विपदा। अयं पदं . . . इति . . . सामयोनिषु; III. 46: सामयोनिषु च संख्याप्रकर्षोऽपीष्यते विराट्स्थानासु विराड्रूपासु च। . . . सा च स्यादक्षरपङ्क्तिः।; III. 64: गोत्रयोगस्तु मन्त्रदृशामृषीणां गोत्रयोगेनेति। अत्र दृष्टार्थ एव स्वराद्युपदेश इत्याचार्याः।

[2] Under III. 6: तत्र त्रैष्टुभजागतौ पादावा दशाक्षरतायाः प्रतिक्रामतः आ पञ्चदशाक्षरताया अभिक्रामतः। आ अष्टादशाक्षरताया इति बह्वृचाः। गायत्र आ दशाक्षरताया अभिक्रामति आ चतुरक्षरतायाः प्रतिक्रामति (cf. *Nid. Sūt.*, I. 6)।

[3] Under III. 6: गुरुवृत्तित्वं चोपोत्तमस्याक्षरस्य गुरुत्वं यथा . . . । एष एव गुरुलघुविन्यासो वैदिकेषु छन्दःसु वृत्तिर्वृत्तमिति चाभिधीयते। . . . अथापरं वृत्तिलक्षणम्—एकादशाक्षरद्वादशाक्षरयोः षष्ठं नवमं चाक्षरं लघ्वेव स्यात्। अष्टमं दशमञ्चैव गुर्वेव स्यात्। तथाऽष्टाक्षरस्य पादस्य पञ्चमं सप्तमं लघ्वेव स्यात् षष्ठं गुर्वेव स्यात् (cf. *Ṛk. Prāti*, XVIII. 6); also *Ṛk. Prāti*, XVII. 22: अक्षराण्येव सर्वत्र निमित्तं बलवत्तरम्। विद्याद्विप्रतिपन्नानां पादवृत्ताक्षरैर्ऋचाम्॥

[4] Under III. 6: पादजातीयकत्वाद्वैकपदानामध्यासवशाद्दाशतय्यामेकपदा इति यास्क आचार्यः। यथा अध्यासाः वीहि-स्वस्तिं सुक्षितिं दिवो नॄन् द्विषो अंहांसि दुरिता तरेम ता तरेम तवावसा तरेम (*Rv.*, VI. 121. 11 cd) वसुं सूनुं सहसो जातवेदसं विप्रं न जातवेदसमित्यादयो (*Rv.*, I. 127. 1b) यमकाभासाः पादाः पूर्वस्या ऋचः पादा एव न पृथगृचः (*Ṛk. Prāti*, XVII. 43: अध्यासाः . . . इत्यादयः पुनःपादाः)।

[5] पुनःपादाः (Uvaṭa on *Ṛk. Pr.*) = यमकाभासाः (Y. P.) cf. *Hem C. Anu.* IV. 25 पौ चौ तौ गलितकं यमितेऽङ्घ्रौ IV. 49: गलितकमेवायमकं सानुप्रासं समाङ्घ्रि खञ्जकम् (for Prakrit) and V. 23: आसां तृतीयस्य पञ्चमेनानुप्रासेऽन्ते दोहकादिश्चेद्वस्तु रड्डा वा V. 30: ते यमितेऽन्तेऽडिला (for Apabhraṁśa).

evolution and *role* of the generic *upajāti* variety (VI. 18) in classic metrics and the *gāthā* (VIII. 1) are points discussed and threshed out by Y. P. in an admirable way.

While commenting on this subject, Y. P. has not missed the utility of their being related, sometimes *per se* but more often as evolutes and developments of the important metres of later metrics, especially in the *Rāmāyaṇa* and the *Mahābhārata*, the epic metres, as they are often termed. He has—and Bhāskararāya has taken the clue from him—drawn the attention of his readers to the exactly identical texture, i.e. with proper attention to their shortness and length of vowels, in the cases of the epic *śloka*, the *upajāti* and the *jagatī*. The fact is that the flexibility in the practice of the Vedic *ṛṣis* in their fashioning the metres has resulted, in certain cases, of their forms approaching and sometimes of representing faithfully and exactly their classic prototypes. Commentators like Yādavaprakāśa have not failed, here and there, to characterize such illustrations as anticipating[1] their classic fixed patterns. Judged from an evolutionary standpoint there has been no violent departure from the Vedic type in the form of later metrical expression and expansion, a point which has been rather extremely stressed by opinionistic writers like Bhāskararāya in connection with certain rare types, as shall be pointed out in details in a subsequent section.

Y. P.'s achievement in the section of the classic metres appears prominently in his *role* as a supplementer of Piṅgala's text therein. That has been the sensible view which has appreciated the justness of this approach, provided they are in the right context. This has been done by others in a form of not being shown in their proper places but of being indulged in with a vengeance right up to the extent of presenting them in the form of *sūtras* of the original work, e.g. by Halāyudha. Y. P.'s model was followed by Bhāskararāya in his *Bhāṣyarāja* on Piṅgala and by many commentators, notably by Nārāyaṇabhaṭṭa in his commentary on the *Vṛ. ratnā.* These items of information were not allowed prominence to the detriment of the textual contents, in accordance with the dicta (*anāpekṣitānām sankoco nānapekṣitavistaraḥ*). In the Vedic portion he seems to be guided by the dictum that nothing, not touched on by the original writer, has got to be explained (*nānapekṣitamucyate*). This is simply from the practical viewpoint of avoiding the overburdening of the later-day student with details which are curious and meant only for the advanced Vedic scholar. In accordance with the old Indian view about authoritativeness (*pramāṇam śāstram*) he introduces and defends them as found in *śāstrāntara*. By this term he means other works on the subject utilized by him or he may have had one particular work in mind, which is difficult to spot out now. The peculiarity in these additional items lies in this that they are mostly written in the form of *sūtras*,

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[1] e.g. अग्निमीडे पुरोहितम् (*Rv.* I. 1.1), यो|वः|शिवतमो|रसस्तस्य|भाजयतेह नः|उशतीरिव मातरः ॥ (*Gāyatrī*); (*Rv.* X. 9.2); गायन्ति त्वा गायत्रिणोऽर्चन्त्यर्कमर्किणः। ब्रह्माणस्त्वा|शतक्रत|उद्वंशमिव|येमिरे॥ (*Rv.* I. 10.1); वायुरस्मा उपामन्थत् पिनष्टिस्मा कुनन्नमा। केशी विषस्य पात्रेण यद्रुद्रेणापिबत् सह॥ (*Rv.* X. 136.7) (*Anuṣṭubh*); उदु ष्य देवः सवितादमूना हिरण्यपाणिः प्रतिदोषमक्राम् (*Rv.* VI. 71.4ab), ऋचा कपोतं|नुदत|प्रणोदमिषं मदन्तः परि गां नयध्वम्। संयोगयन्तो|दुरितानि|विश्वा|हित्वा|न|ऊर्जं प्रपतात्पतिष्ठः॥ (*Rv.* X. 165.5) (*Triṣṭubh*); उभा हि दस्रा भिषजा मयोभुवा (*Rv.* VIII. 861*a*), त्यक्तुं न यक्कं उषसः पुरोहितं तनून् पातम् अरुषस्य निंसते *Rv.* X. 92.2cd तवाहमद्या मघवन्नुपस्तुतौ धातर्विधातः कलशां अभक्षयम्॥ (*Rv.* X. 167.3 cd) (*Jagati*).

which, as in Piṅgala's work, unlike what has been the practice of later writers, are not composed in the metres concerned, and follow closely the technology of the Piṅgala system. The one work, which certainly is older than Y. P. but not very much older, the *Jānāśrayī Chandoviciti*[1], follows the Piṅgala pattern of *sūtras*—rather overdoes it, but it uses a different and a more complex technology. This would serve to draw our attention to the fact of the lamentable loss of early works on metrics, a point which other works (e.g. Jayakīrti's *Chandonuśāsana* towards the end) suggest. Some of the names of metres[2] in Y. P.'s additional list agree with those of Hemacandra which are deducible from his *sūtras*. A few agree with those in the *Jānāśrayī*. Y. P. has done yeoman service in furnishing such a list, which includes metres cultivated in later fashionable literary circles. Halāyudha's resort to *āmnāya* or *sampradāya*[3] in his *Mṛtasañjīvanī* has a minor and limited objective, viz. of referring exclusively to the valid division of the verse and of its feet.

In this treatment of the classical (*laukika*) metres, unlike Halāyudha and others, Y. P. starts with their twofold[4] division accepting the *varṇas* (syllables) and *mātrās* (syllabic instants), the former of which he labels as *varṇajātis*, the latter as *mātrājātis*. His treatment of the latter is on the lines of Piṅgala himself—he sticks to this subdivision as far as they are divisible again into *gaṇas* (as in the *āryā* class) or not (which he styles as *nirgaṇajātis*, e.g. as in the *vaitālīya*). He avails himself of the opportunity of recording that instances[5] of the former are met with in the Vedic literature, too. Both of these set classes are well represented in early Prakrit literature, early mediaeval Prakrit poets (of the fifth to the ninth century) having expanded[6] and enriched their scope, so much so that *mātrā chandas*

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[1] Vide *The Jānāśrayī and its Author* (*J.O.I.*, Baroda, Vol. IX) and *Further Light on the Jānāśrayī Chandoviciti* (*J.O.I.*, Baroda) by the present author.

[2] e.g. उद्धता under VI. 3 (*Jānāśrayī Chandoviciti*, IV. 17, and Hem., II. 56); उत्सुक under VI. 8 (Hem., II. 93); अचि under VI. 8 (Hem., II. 96); मणिराग under VI. 14 (Hem., II. 117); प्रत्ययबोध under VI. 27 (Hem., II. 132); जलोद्धतगति under VI. 34 (*Jān.*, IV. 52); नन्दिनी under VII. 3 (*Jān.*, IV. 65); सुन्दर under VII. 13 (Hem., II. 256).

[3] Vide also ref. to II सम्प्रदाय in the *Vṛ. Cand. Ud.* (f. 80–81*a*) of Bhāskararāya. As under विद्युन्माला (VI. 6); भुजंगशिशुभृता under VI. 7; हलमुखी VI. 8; पणव VI. 11; मत्ता VI. 13; उपस्थिता VI. 14. Y. P. admits their authoritativeness.

[4] Y. P. under IV. 12: द्वयाणि खलु च्छन्दांसि वर्णजातयो मात्राजातयश्चेति। तत्रोक्तादय उत्कृत्यन्ता वर्णजातयः।... मात्राजातयः पुनरार्याऽऽदयः...। मात्राजातयोऽपि गणजातिर्निर्गणजातिश्चेति।

[5] Y. P. under VI. 12: तासु च काश्चिद्वेदेऽपि दृश्यते। तथा चाथर्वणिकाः श्लोकमार्याजातीयमामनन्ति—घृतमिव| पयसि नि|गूढं|भूते|भूते|च वसति|विज्ञा|नम्। सततं|मन्थयि|तव्यं| मनसा|मन्था|न|भूते|न॥

[6] For मात्रावृत्त in Kālidāsa, *Vikr. Ur.*, IV. 56 (N.S. edn., p. 112): अभिनव|कुसुम| स्तवकित|तरुवर(5)|स्य परिस|रे (23)। मदकल|कोकिल|कूजित|झंका|र मनोह(5)|रे (23)। नन्दन|विपिने|प्रियतम|करिणी|विरहा (5)न|ले (23)—स्तम्रो|विचरति|गजाधि|प ऐरा(5)|वतना| मा (23)॥ The verse is designated गलितक in the text in which there is a five-more *gaṇa* in each quarter as indicated. It is गलितक according to the *Jānāśrayī*, IV. 45, and of the खञ्जक sub-class according to Hemacandra (IV. 49). Koṇeśwara (should we read his name as Koleśwara ?), the Bengali annotator (whose work as in the Asiatic Society Manuscript Govt. Collection is written in proto-Bengali which may be of the twelfth century A.D.), and Ranganatha admit this Sanskrit verse in the text. The views of S. Pandit (Bombay S.S. edn.) and his followers, who reject the Prakrit passages as

became, *par* essence, the vehicle of certain types especially of the lyrics and devotional pieces, and Y. P. could not but be aware of them. Such verses in Sanskrit appear in early Prakrit literature as companion specimens,[1] and occasionally in descriptions and laudatory stanzas[2] (*stotra*) in pure Sanskrit (e.g. *campū*) works, in both of which *roles* they branch out as separate *kāvya* patterns,[2] e.g. in the *bhogāvalī* and *virudāvalī*.[3] In dramas, in operas or musical *kāvyas* (the *rāgakāvyas*)—as well as in the *toṭaka*, *rāsaka*, *nāṭyarāsaka*, *prasthāna*—they are in evidence. The testimony of the two metricists, Virahāṅka and Svayambhū, who certainly preceded Y. P., and composed their works dealing primarily with Prakrit metrics in Prakrit—the former, however, deals secondarily with Sanskrit metres in Sanskrit—and that of the *Jānāśrayī Ch. viciti*, which treats of *mātrāvṛttas* of a new pattern,[4] not envisaged in Piṅgala's work and in those of his close followers like the poet Jayadeva, and of the *Chandonuśāsana* by Jayakīrti,[5] who lived not far away from the time of Y. P., go to vindicate their wide acceptance and their delectability to the discriminating scholar. The use of *padas* (lyric pieces) in Jayadeva's *Gītagovinda*[6] (close of the twelfth century), a work fashioned on the old *sargabandha* pattern, is significant. The songs there are reducible to the pattern of the *pādākulaka* metre—labelled by some later metricists as *gītavṛttas*—discussed in Piṅgala's work,

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also the Sanskrit verse, have been refuted by the present writer in a paper of his ten years ago and have been refuted very recently by H. D. Velankar in the *Sahitya Akademi* edition of the drama. The last three lines are apparently dissimilar in different MSS., so much so that the number of *mātrās* in them is different. In that case the गल्तिक is of the विषम variety as defined by Virahāṅka in the *Vṛttajātisamuccaya* (Ch. IV). Vide *Jottings on Sanskrit Metrics*, p. 32, on this point.

1 e.g. in the कुवलयमालाचम्पू (composed in A.D. 779) a mixed Prakrit work of that type. सुरपतिमुकुटकोटितटविघटितकोमलपल्लवारुणं सललितयुवतिनमितसुरपादपनिपतित-कुसुमरञ्जितम्। अभिनवविकसमानजलजामलदललावण्यमण्डितं प्रथमजिनचरणयुगलमिदं नमत गुरुतरभवभयहरम्॥ (28 *mātrās* in each foot) cited as द्विपदीखण्ड (p. 116. Singhi Jain series, 1955, edited by A. N. Upadhye). This is of the मात्रासम variety of that metre.

2 e.g. in यशस्तिलकचम्पू (tenth century A.D.), N.S. edn., part I, pp. 178–89 (12 verses in succession in *mātrā chandas* including चतुष्पदी, रड्डा, etc., forming panegyric matter and part II, pp. 182–83, containing a description of a locality named कारहट again in a series of मात्रावृत्तs).

3 These are treated in the *Saṅgītaratnākara* (Ch. IV) as *saṅgītaprabandhas* and in the *Virudalakṣaṇa* by the Bengal Vaiṣṇava Rūpa Gosvāmin, vide *Jottings on Sanskrit Metrics*, p. 18, footnote 40. One mediaeval compiler Puruṣottama in his *Chandomakhānta* (Varendra Research Soc. MSS.) calls these verses *gītavṛttas*.

4 No less than 28 of the *sūtras* (45–72) are unorthodox (*anārṣa*) in the sense that they are not derived from Piṅgala's *Ch. Sūt.* and refer to the patterns in use in Prakrit as also in Sanskrit metrics. The illustrations in the *Sūt.*, as usual, are in Sanskrit verses.

5 13 of the 37 sūtras in Ch. VI of his *Chan. anu* deal with such metres and are later considered by Hemacandra in Ch. VII of his *Ch. anu.*, while Ch. VII deals with *mātrāvṛttas* as in Kanarese and form a good introduction to Kanarese metrics.

6 Vide f. 3*b* of the *Bhāṣyarāja* and f. 61*b* of *Vṛ. Can. Ud.*: ...जयदेवादिप्रयोगा (विकशितघरसिजपरिमलसुरभिनो) त्यादयो गीत्यार्यादिप्रयोगाश्च प्रामादिका एव। (संहतोऽमात्र-कोज्ञेयो विहतश्च द्विमात्रक) इत्यादिपाणिनिशिक्षाविरोधात्। The above *pada* as read in printed edition (VII. 32) is different and is to be judged from a different standpoint—it is a *mātrāsamaka*, *ibid.* (f. 176*a*): एतत्प्रकरणस्थानां प्रायेण संगीतशास्त्रोक्ततालविशेषेषु विशिष्टोपयोग-दर्शनात् and (f. 232*a*): ...रोलाचरणचतुष्टयम्। अष्टपदी सा भवति विविधकविकौशलगमकम् of the *Vṛ. Can. Ud.* are his observations in this connection.

in a good number of cases with this difference that the number of *mātrās* in the different *padas* (e.g. in the *daśāvatāra stotra*: *pralayapayodhijalē* . . . . . and *vadasi yadi kiñcidapi* . . . . .) is not uniform. Bhāskararāya also recognizes such types and accepts them in the fold of *pādākulaka*. The attitude of Y. P. in not directly mentioning *mātrāvṛttas* of this pattern, which had forced their way into Sanskrit literature as well, is probably to be explained by his partiality to Vedic affiliation, which, as a discriminating student of Piṅgala's *Chandaḥsūtra* (*vedāṅga*) he could not readily accede to but which he could only tolerate.

It is this divided sympathy in his attitude that has led him to refer to the view that the *āryās*, the type of *gaṇamātrā-vṛttas*, so popular in other camps (*śāstrāntara*) by the name of *gāthā*, are traceable in the Vedic literature also.[1] That he cites one instance of the *āryā*, which is copied by Bhāskararāya in his works, is not to be adduced as an evidence for his general acquiescence in the hypothesis of *mātrā-vṛttas* as being *ārṣa* or ancient. Indeed the advocates of this hypothesis had to cite from a late work of Vedic literature (the *Brahmabindūpaniṣad*) for no modern scholar would accept it as definitely of pre-Christian era. That *āryās* were known in plenty before this time, as we have noted in the *Jottings on Sanskrit Metrics*, may have a certain force as an argument to the contrary. But there is no gainsaying the fact that while the full-fledged *āryā* in its rigid form may be rare in early Vedic literature, there were conscious attempts in metrical compositions in the form of what one may call *proto-āryās* which led to this direction. Some of these have been referred to by us in the dissertation mentioned above; for in tracing the *āryā* to its sources one cannot peremptorily set aside such forms of Vedic metres, particularly as in essence they were derivatives of the *anuṣṭubh*. He, however, does not go so far as the later opinionetic Bhāskararāya, who cites the authors of a Vedic text—it is a late Vedic text, however, not so old and authoritative as the *Rk. prātiśākhya*, the *Nidāna-sūtra* and the *Anukramaṇīs* of Śaunaka and Kātyāyana—which accounts for the *daṇḍaka*[2] (as well as for the *mātrā-vṛttas*[3] in general), a finished and artificial form rarely met with in the early epics and in pre-Christian *kāvya* literature.

Y. P.'s illustrations in the classical section of his commentary call for some notice. Authors of works like the *Chandoviciti* of Mitradhara which could not have been composed later than the third century A.D. have taken up the *role* of illustrating the *sūtras* concerned by verses of their own composition. Y. P.—unlike the mediaeval commentators on Alankāra treatises, generally but not universally, and like many other authors of manuals on the subject—has chosen to follow this tradition. Halāyudha, however, has illustrated by verses from classical works and has also a few citations traceable to the *Chandoviciti*, and possibly some more from certain allied works on the subject—but he, too, has a preponderating proportion of

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[1] Y. P. under IV. 15: गाथानामैषार्या शास्त्रान्तरेषूक्ता।

[2] *Bhāṣyarāja* (f. 48*b*) and *Vṛ. Can. Ud.* (f. 106*a*): अत्रोत्कृतिपर्यन्तानामित्युक्तिरयुक्ता दण्डकेष्वपि वैदिकत्वस्येष्टत्वादाथर्वणवैदिकच्छन्दस्वितावध्यक्षराण्युच्यन्त इत्युपक्रम्य 'चतुरक्षरान्तेत्यादि चतुःशताक्षरोत्कृति'रित्यन्तमुक्त्वा "अतः परं दण्डका भवन्ती"त्येषां लक्षणमित्युपसंहारेण दण्डकानामपि वैदिकान्तःपात उक्तः। (vide *Ātharvānukrama Sūtra* . . . Lahore edn.).

[3] *Vṛ. Can. Ud.* (f. 106*a* to 106*b*): यत्तु मात्राच्छन्दसां वेदे क्वाप्यदर्शनं तदुद्गतादीनामदर्शनेन तुल्यम् . . . दृश्यन्ते च मात्राच्छन्दांसि गोपथब्राह्मणे पञ्चमप्रपाठको(?)क्तावतिरात्रषट्शतमाग्निष्टोमा द्विविंशती उक्थ्यादीनि पादाकुलकाभासानि वृत्तानि।

verses of his own composition as illustrations. Y. P. occasionally cites verses from classical literature, especially the *Bhagavadgītā* and the works of Kālidāsa, with this difference in presentation that they are noted to confirm or strengthen a way of exposition and not as illustrations for the *sūtra* text. This has been the method followed by almost all later writers on the subject like Gangādāsa, Nārāyaṇa-Bhaṭṭa and Bhāskararāya. The bulk of Y. P.'s own illustrations is furnished by his acquaintance with the *Kāmaśāstra* (including the *Vaiśika* section) and the treatises on physiognomy, the features (*lakṣaṇa*)[1] of males and females,[2] of which latter we have an inkling in several of the Purāṇas and in the works of an encyclopaedia type like the *Mānasollāsa*. A predilection for such forms is traceable in the illustrations of the *Nāṭyaśāstra* and the *Chandoviciti* of Mitradhara as well. Y. P. indulges, in one section, in illustrations from palmistry or popular astrology[3] (*phalitajyotiṣa*), as distinct from astronomy (i.e. *gaṇita jyotiṣa*) where this is used notably, as in the *Bṛhatsaṁhitā* composed in the *kāvya* manner, in which one entire chapter (Ch. 103) is devoted to illustrating no less than fifty classical metres pleasant to the ear (*śrutisukhada*), including the varieties of the *mātrāvṛtta āryā*, and unfamiliar *vṛttas* like the *bhujaṅga-vijṛmbhita* and the *meghavisphūrjita* and the *dodhaka*, which were studiously eschewed from the ordinary classical armoury.

Y. P.'s specific contribution towards the practical aspect of classic metres lies in his emphasis on the derivation of several metres of different lengths from a particular metre, a fruitful way of multiplication of *varṇa vṛttas*, generally of the *sama* (uniform) variety, which the writers arrived at by the process of experimenting on new types. We are not sure whether among expositors of the *śāstra* it was he who first lighted upon this device. Sufficient it is for our purpose to note that he has disclosed this principle by his pointed attention to it in different contexts. Amongst later writers who dwelt with it at good length is the thirteenth-century Jaina poeticist Amaracandra (a writer on *Kaviśikṣā*), and the manner of his analysis of this device has been referred to and explained by us in *Jottings on Sanskrit Metrics*. Y. P.'s mode of analysis is more methodical and broad-based. Amongst methods of such diversifications he singles out are: (i) the repetition of any number of particular *gaṇas*, where the metre is solely of *one-gaṇa* texture[4] as in the case of the *toṭaka* or the *bhujaṅgaprayāta*, (ii) the repetition of any number of either of the constituents (one of which is the long single

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[1] e.g. under V. 33: (अपराध्यति . . .), VI. 37: (वदत्यशेषम् . . .), V. 40: (कुसुमितशिरःसु . . .), V. 42: (इति किल नरपतिरसण . . .), VI. 6: (अपमधु सुमनसमलिरिव पतिरपि। विरसयुवतिमयमफलमभिसरति), VI. 8: (ललितं . . .), VI. 13: (यद्दामलं . . .), VI. 2: (रामां तनु . . .), VI. 3: (भुजाविभूषा . . .), कूर्चेपेण . . . अंशुकम्; या विमुच्य केशान् स्वान् सन्निधौ निबध्नाति। यातिशान्तिसुद्वीक्ष्य क्रोधनेऽपि सा स्निग्धा।

[2] e.g. under V. 12: (वक्त्रं प्रधानमङ्गानां नेत्रं प्रधानमस्यापि। समुद्रवीक्षणे तस्मान्मुख्यं मुखञ्च नेत्रञ्च . . . त्रिगम्भीर॥ . . . नाभिस्वर), V. 13: (दीर्घाणि जिह्वा . . . उन्नतानि . . . पाण्योस्तलेष . . .), V. 14: (अङ्ग उच्चं मांसलं वा चिपिटं वा शिरालं वा। यत्तद्दृष्टमतस्तनुर्विपरीतोत्तरा पथ्या॥ . . . त्वकस्नेहे . . .।), V. 15: (शङ्खातपत्रशिविका . . . मणिबन्धात् . . .)।

[3] e.g. under V. 8: (वारेण भृगोः . . . सौम्यवारेण स्यात् . . . जयया सार्धं कुजवारश्चेत्। अतिसौख्यानां घनपङ्क्तिः स्यात्॥ सदा तु रिक्ता . . . या खलु पूर्णा . . .)।

[4] e.g. under VI. 32: (एवं षट् स चेद्वृत्तौ ललिता नाम वृत्तं स्यात्; 5 सs नलिनी; 3 सs सौम्या); VI. 35: (एवं षट् चेद् यो व्याप्यायनीनाम वृत्तं स्यात् . . .)।

syllable *ga*) in a *two-gaṇa* texture[1] as in the case of the seven-syllabled metre *kamalā* noted by Bharata with a different name and of the eight-syllabled *citrapadā* of Piṅgala, (iii) the taking in, or away, of any number of short syllables (*la*) and substituting it by long syllables (*ga*)—as in connection with the fifteen-syllabled metre *maṇigaṇanikara*,[2] and (iv) the modification of a particular scheme with particular parts or fossils (*rūpakalpa*) remaining intact, by adding, taking away or pitchforking another such of fixed pattern, as in connection with the seventeen-syllabled *mandākrāntā* or in the case of the twelve-syllabled *pratyavabodhā*.[3] The obvious cases of stretching as in the case of *vidyunmālā* and the shifting of the long syllable at the end by the addition of a short one, in the penultimate portion, as for the *upajāti* and *vaṃśasthā* are too well known to merit special mention. Two illustrations are here added to bring home the manner of operation:

| | S | | S | | S | | S—*toṭaka*
| | S | | S | | S | | S | | S—*bhramarāvalī* (*Prākṛ. Piṅg.*, II)
| | S | | S | | S | | S | | S | | S—*lalitā* (Y. P. under VI. 32)

| | | | | S—*abhijit* (Y. P. under VII. 12)
| | | | | | S—*sarala* (Y. P. under VII. 12)
| | | | | | | S—*lalitagatī* (Bharata, *Nāṭyaśāstra*, XXXII. 130 N.S. edn.)
| | | | | | | | | | | | | | S—*maṇigaṇanikara*
| | | | | | | | | | | | | | | | | S—*śukapada* (Y. P. under VII. 12 and *Prakr. Piṅg.*, II)

(| is the symbol for the short syllable, S for the long one, according to the traditional mode of representation.) The case of difference in effect and consequently of nomenclature due to shifting of the caesura (*yati*), as in the oft-cited instances of the fifteen-syllabled varieties of *candrāvartā* (7+8), *mālā* (6+9), *maṇigaṇanikara* (8+7) and *rucirā* (4+11) (noted in passing by Jayakīrti), is different and need not be regarded as pertaining to derived metres. Again it is he who has advocated the theory[4] of deriving *ardhasama vṛttas*—and analogously of the *viṣama vṛttas*—from *sama vṛttas* by the process of grouping together patterns of each specimen in the manner of the hint given by Piṅgala himself in his conception of the *upajāti*. We have dwelt at length on this item in the *Jottings*, to which work we refer our readers.

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[1] e.g. under VI. 5: (तथा यदि षड्भगणा गुरू च द्वौ कृतौ सरोरुहनेत्रा . . . यदि सप्त विकृतौ मयूरगतिः; यद्यष्टावुत्कृतौ प्रवीराचितम्); VI. 19: (भ ग ग ग विक्रान्ता—cf. *Nāṭ. S'ās.* XXXII. 22).

[2] e.g. under VII. 12: (ईदृशं गायत्र्यां वृत्तमभिजित्; उष्णिहि सरलम्; धृतौ विमलम्; अतिधृतौ शुकपदम्; प्रकृतौ कनकलता; अभिकृतौ समकम्)।

[3] e.g. under VI. 27: (अत्र नवभ्यो यदि खलु सगणस्ततो जगणः धृत्यां ललना); VII. 18: (अष्ट्यामेषा मदनललिता; तसौ चेत् दशकाद् भाराक्रान्ता; षट् चेल्लघव इह तदमुष्यां धृतौ चन्द्रलेखा); VII. 19: (धृतौ तु क्रौडेयं यदि तत् सौ द्वौ द्वादशपरौ)।

[4] Y. P. on V. 27: एतौ त्रैष्टुभयोर्द्वयोः समवृत्तयोः पादौ संहतावेकमर्धसमवृत्तम्। अयं न्यायोऽन्यत्रापि स्यात् तेनान्येऽपि . . . पादाः द्वौ द्वावेकभूयं भूत्वा बहून्यर्धसमानि सम्पद्यन्ते।

With such outstanding merits to its credit it would appear strange that Y. P.'s work is not familiar to the rank and file of students and is ignored by almost the whole host of later writers on metrics. While Halāyudha as the *vṛttikṛt* has achieved renown in so far as his views are profusely cited and referred to, Y. P. is unhonoured and unsung. There are two considerations to be remembered in this connection. Tradition in India is continuous and an eminent author lives through his works. Instances are not rare in almost every department of Sanskrit literature where authors of outstanding achievement have not got their due at the hands of posterity. A writer who honours the tradition and is instrumental in strengthening it even but is not challenging or aggressively original is apt to be ignored. There is also the question of the assessment of approach to a subject in the light of theories talked about. Halāyudha's observations on crucial points like those on *gante* (I. 10), *dhrādiparaḥ* (I. 15) on *pādaścaturbhāgaḥ* (III. 11), on the definition of the *āryā* (III. 15), and on *yatirvicchedaḥ* (VI. 1) have got to be read with those of Y. P. thereon to account for this difference in recognition. Many of the hypotheses of Halāyudha have been severely criticized, whereas many of Y. P.'s views have been absorbed and forming, as they do, a part of the old tradition, have, in their turn, been handed down, though without acknowledgement. Two possible objections to Y. P.'s work relate to the terseness in manner, rather to the archaic manner, of his expression and to the indifferent illustrations (*acamatkṛtikāḥ ślokāḥ*),[1] in which class one would include gnomic verses, a partiality for which is noticeable in some metrical treatises. The former was nothing more than a pose, to invoke for the work an old flavour. The latter, it must be said in retort, is not peculiar to him—almost all the writers on metrics (the one notable exception is the *vṛtti* to the *Jānāśrayi Chandoviciti* which, by the way, uses a good many pleasant and attractive verses from rare early works[2]—and its author had to resort to this practice, because a considerably high percentage of metres is not traceable in the orthodox Sanskrit classes) suffer from this unimpressive performance. In poetics also this is the case except in gifted writers like Paṇḍitarāja Jagannātha. In Y. P.'s case, however, there are a few exceptions.[3] The prominence afforded to the Vedic portion in his treatment

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[1] e.g. *Vṛ. Can. Ud.* (f. 1*b*, *v.* 11): अचमत्कृतिकश्लोकाढ्यैका नवा इव योषितो जरठाः। त्रपयन्ति वयः कृतिनां न मनागपि रञ्जयन्ति चेतांसि॥ Gnomic verses under IV. 28: (आस्तां विमुक्ति ...); IV. 32: (कुर्वन्त्वार्यागीतिं ...); IV. 34: (पश्यत्सु परेषु मीलिताक्षाः निभृताङ्गाश्च रहस्यभीष्टचेष्टाः। चरितं परिमोहनं परेषामौपच्छन्दसिकं खलाश्चरन्ति॥); IV. 40: (स ह्यास्य-सुपयास्यति ...); IV. 42: (या परान्तिकं ...); V. 28: (उद्धूतं क्रियया)।

[2] *Ibid.*, p. 15: हरिचन्दनमुत्पलयूथिका कोकिलनेत्रनिभा मदिरा च। तपसो न कृशस्य फलं न्वणां रूपगुणाभ्यधिकाश्च युवत्यः॥ p. 20: ईश्वरः कुरुते चेत् पातकान्यखिलानि। तत्र भक्तिविशेषः कं गुणं नु समीक्ष्य॥ = (*Jātakamālā*, XXIII. 36); p. 25: गम्यतां यथेष्टमेष तेऽञ्जलि-स्त्वां चिकित्सितुं कुतो मनोरथः। तस्य ते गृहीतरोषया मया पादताडितस्य दौत्यमागतम्॥ p. 37: कोऽसि त्वं मे का वाऽहं ते (*Ubhayābhisārikā*); p. 46: चारित्रनिर्मलजलः सत्पुरुषनदोऽच्चयो भवतु नित्यम्। यस्य विभवारविन्दे मित्रभ्रमराः कृतविहाराः॥ (of Sundarapāṇḍya); p. 52: अभिनव ... रमयन्ति मानसम्॥

[3] Under IV. 22: (निजसुखविपुल; ...) V. 32: (महति तपसि ...); VI. 17: (तदेव सिध्येद्...) VI. 16: (योऽस्येन्द्रवज्रा...); VI. 39: (प्रमिताक्षरेण...); VI. 18: (यद्वाऽपराधोऽत्र न कामिनीनां तास्वापि पुंसा नयनैः स्खलन्ति। स्त्रियः पुमांसश्च तथैव सृष्टा यथा मिथोजा उप-जातयोऽपि॥ लज्जा गता क्वापि च लज्जितेव श्रुतं क्वचिच्छ्रोत्रपुटे विलीनम्। कुलाभिमानो मुनिरेव मुक्तो मुक्ते वधूभिर्नयनांशुपाशे॥ तिष्ठन्तु वामाकुलदृष्टिपाता भावाश्च तेषामुपजातिभेदाः।

has also served to scare away readers, because Vedic metrics has been almost a 'dead' topic in the history of mediaeval Sanskrit metres. The fact is that easy comprehensibility by the general student of modern ability (*bālānām sukhasiddhiḥ*: *Vr. ratnā.*, I. 3) has dominated all other considerations and it is no wonder that Kedārabhaṭṭa, in spite of the Vedic pedigree of his parentage (the only specimen of his Vedic scholarship being evidenced by his *verbatim* reproduction of the text of the list of the genera of metres with Vedic appellations in I. 19–21 from the *Viśvāmitra-kalpa*[1] on the *gāyatrīhṛdaya* section), scored success as the standard writer on classical metres, in one sense, the greatest amongst the non-holy works (*anārṣī-kṛti*). Confining itself to this viewpoint of Piṅgala, keeping itself aloof from the controversial issues (which well-informed commentators had often to rake up to maintain the continuity with the growing practice in the literature), which pertain to it as within the purview of the *śāstra*, Kedārabhaṭṭa adhered to the manner and plan of the Jaina promulgator, Jayadeva, in his *Vr. ratnā.* by following the mixed presentation (*lakṣyalakṣana-samyuta*: *Vṛ. ratnā.*, I. 3), the (*miśrīkṛta*) form, to use the language of the *Chandoviciti* of Mitradhara, i.e. of having the definition and illustration together. Though in certain details the views of Kedārabhaṭṭa do not tally with those of Y. P., there are sufficient indications, however, which point unmistakably to his familiarity with Y. P.'s work,[2] as in I. 6, I. 9, I. 10*d* which read like direct echoes of Y. P.'s introductory verses and of the views propounded by him. It is no exaggeration to say that Ch. I of the *Vṛ. ratnā.* is a direct adaptation in verse of the method of exposition of Y. P., and commentators on his work have found in the expression *Piṅgalādi* (*Vr. ratnā.*, I. 4) a reference to the *bhāṣyakāra* on Piṅgala's work. One of the best-known commentators Nārāyaṇabhaṭṭa, himself a Southerner like Kedārabhaṭṭa and Y. P., has used the work[3] of Y. P. in quite a good number of instances. In his treatment of *yati*-division he has, it appears, included this work in the *sampradāya* and has sometimes referred to its view as that of *kecit*.

The parallel development of Prakrit and *apabhraṁśa* metrics, which came as a necessary sequel to the flourishing of these literatures uninterruptedly for four or five centuries (fourth to ninth century A.D.), and had their pioneers

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एकाऽपि वाणी स्मितमञ्जुरासां करोति पुंसामितरामवस्थाम्॥); VII. 28: (यद्गितवाणीं विदुरतिमधुरां स्वादुरसामिव रसगुणयोगात्। शुद्धसदर्थं निवदति बहुलं श्रीरिव वारिधिपयसि विशाला॥ वर्णविशेषैः कृतशुभरचना चित्रवधूरिव समभुवि तन्वी। क्वापि च तत्त्वं विस्मरति यदि सा सर्वजनैरपि भवति निषेव्या॥)।

[1] As noted in the *Vṛ. Cand. Ud.*, f. 130*a*.

[2] *Vṛ. Rat.* I. 6 = Y. P. Intro., Verse 1; *Vṛ. Rat.* II. 37: (यदतीत ... =पादाकुलकं) = Y. P., IV. 48: (एभिः मात्रासमकादीनां पादैर्मिलितैः...); *Vṛ. Rat.* III. 36: (वानरसैः...श्री) = Y. P., V. 27: (कुड्मलदन्ती श्रीर्वा। पञ्चसु षट्सु यतिः।); *Vṛ. Rat.* III. 92: (नजभजरैः... वाणिनी) = Y. P., VII. 14: (अपि च नौ या स्त्रयो रगौ च वाणिनी।... इदमेव सप्तमाष्टमयोर्लघुगुरुव्यत्यासात् केषाञ्चिद्वारुणी (according to Hemacandra and Kedāra वाणिनी); *Vṛ. Rat.* III. 92: (नर्कुटकम्) = Y. P., VII. 19: (नजभा जौ द्वौ ल गौ च नर्कुटकम्)।

[3] Under *Vṛ. Rat.* I. 9: (तदुक्तं दीर्घं संयोगपरं) = Y. P. Intro., Verse 4; *Vṛ. Rat.* II. 8: (केश्चिदार्याभेदत्वाङ्गीकाराद्गीतिर्लक्षयति) = Y. P., IV. 14: (एतेन पञ्च प्रकारेण आर्याः कर्तव्याः।... तास्व पञ्चतय्यः गाथा गीतयस्तस्व इति); *Vṛ. Rat.* under III. 1 extra *sūtra*: (कुमारललिता ...अत्र द्वाभ्यां पञ्चभिश्च यतिमाहुः केचित्।) = Y. P. under VI. 3: (केचिद्द्वयोः पञ्चसु यतिमाहुः); *Vṛ. Rat.* under V: (केशवाद्या इव चतुर्विंशतिभेदा भवन्ति = Y. P. under V. 19: (तेनेद [पदचतुरूर्ध्वं] चतुर्विंशतिधा भवति)।

in Śrīpādapūjya, Devanandin, Prabhusena and others and of which the treatises of Virahāṅka and Svayambhu are landmarks, served also to attract students away and to damp the enthusiasm of students engaging themselves to its orthodox Vedic form associated with Yāska, Saitava, Piṅgala, etc. In their own way, however, they sought to enrich the science by investigations into the potentialities of the *mātrāvṛttas* and of their musical counterparts which had their repercussions on late mediaeval literature on the subject. This was followed both in North and South India vigorously throughout during the Middle Ages in the works of the Jaina master, Hemacandra (twelfth century), and studiously pursued, as the *Kavidarpaṇa* and the *Ratnamañjūṣā*, to mention the prominent ones, go to show. The prime achievement of this movement took shape in the classical *Prākṛtapiṅgala* which was fathered on the *nāgarāja* Piṅgala. This work provided an adequate and easy account of classical Sanskrit metres as well with all its paraphernalia of *prastāra* and engrossed the attention of writers and students alike.

One tangible result of this has been the lightening of the discipline of old metrics, as is indicated by the opening pages[1] of this last work where irregularities and violations of the fundamental axioms of the *śāstra* are condoned, if not directly encouraged. In the midst of such diversionary activities it is idle to expect a just response to the spirit and manner of study envisaged in commentaries like those of Yādavaprakāśa which, while keeping note of and being susceptible to the tendencies of the *śāstrāntaras* that had sprung up, would not forego their old *śāstric* leaven. The general provision of alternative forms of approach, which was nothing more than a regularization of anomalies, born of a spirit of adjustment like the Paninean rule *chandasi bahulam* in the realm of grammar, it would appear, had come to stay and paralyze the *śāstric* stamina of old metrics.

Bhāskararāya, the last important writer on the *Piṅgala-chandas* (*vedāṅga*), has tried his best to stem the tide, of which he was too conscious, though, like a practical politician,[2] he, too, has had to concede to a good number of lapses and violations. A clever and vastly-read scholar as he was, he exploited his acquaintance with old literature including the Vedas and the *Āgamaśāstra*, his favourite diversion, to uphold his position in such cases often with the help of the Mīmānsā doctrines of interpretation and on the analogy of uses in grammar. Like the general run of writers on metrics, he did not fall an easy prey, however, to the cheap and popular practice which

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[1] *Prā. Piṅ.*, 14: (कुणुवि संजुत्तपरो वण्णो लहु होइ दंसणेण जहा। परिह्लसइ चित्तधिज्जं तरुणिकडक्खम्मि णिव्वुत्तं॥ *Sar. Kan. ābh.*, I. 123: यदा तीव्रप्रयत्नेन संयोगादेरगौरवम्। न च्छन्दोभङ्गमित्याहुस्तदा दोषाय सूरयः॥); *Prā. Piṅ.*, I. 7: (चेउ सहज हुइ चञ्चला सुंदरि ह्रदहि वलन्त। पञ्च उण खुल्लसि खल्लना किलसि उण उल्हसन्त॥); *Prā. Piṅ.*, I. 8: (जइ दीहो विअ वण्णो लहु जीहा पडइ होइ सो वि लहु। वण्णो वि तुरिअ पडिओ दो तिण्णि वि एक्क जाणेहू।)।

[2] *Vṛ. Can. Ud.*, f. 47*b*: (वैयाकरणानामिव छान्दसीयानामपि शाब्दिकत्वाविशेषेण प्रयोगशरणता।); *Vṛ. Cand. Ud.*, f. 75*a*: (एवमन्येऽपि महाकविप्रयोगा बहुदर्शिभिर्विमृश्य यथाऽनुभवं समर्थनीयाः।); *Vṛ. Cand. Ud.*, f. 76*a*: (एतेन प्रक्षे . . . इति छन्दोमञ्जरीकाराणां तथा सुल्हणस्य . . . छन्दःशेखरकाराणामन्येषाञ्च सङ्कुचितोक्तयः पूर्वप्रदर्शितप्रयोगावाप्तेरेव नादर्तव्याः।); *Bhāṣyar.*, f. 103*b*: (तथा च महानाटके 'कोपात् सोऽपि दशाननेन' इत्यादि स्रग्धरापादत्रयेण सुप्तिप्रबोधपरिवर्जनमेव वर्ज्यमिति वसन्ततिलकापादस्य मेलनदर्शनाद्यथाप्रयोगमेव नियमनं युक्तम्। While explaining the *sūtra* आद्यन्तावुपजातयः। cf. महानाटक, Verse I. 5 (Jiv. ed.): रामं लक्ष्मणपूर्वजं, etc., which is an उपजाति formed of शार्दूलविक्रीडित and स्रग्धरा metres.)।

had become the rule from about the fifteenth century onwards in writing so-called independent treatises. What he did was an attempt to tread the lines of what they regarded as foolhardiness to write commentaries on the accredited classics of the subject like Piṅgala's work and the popular *Vṛtta-ratnākara*, on both of which he tried his hands in the old *śāstric* manner. While he was a young boy of seventeen[1] he wrote his first work on metrics, *Chandaḥkaustubha* (not to be confused with an earlier work of the same name, presumably an exposition of Piṅgala's work, which he mercilessly attacks in the *Vṛttacandrodaya* off and on, and with a later handbook much in favour amongst the Bengal Vaiṣṇavas). In this early venture (*Chandaḥ kaustubha*) even he had strictly adhered[2] to the *śāstric* manner and standpoint, a mode of approach vigorously followed in his two mature works on the subject already mentioned, and aggressively put forward in the metrics sections of his polemic, the *Vādakutūhala*. At the same time, like Śaraṇadeva, the Bengali expert on Paninean grammar of the twelfth century, the author of the *Durghaṭa-vṛtti*, a work[3] which he seems to have cited on more occasions than one, he has amassed a vast amount of materials from all departments of literature, but mostly from literature proper,[4] which are lapses from the standpoint of the dicta of metrics and has sought often to justify them and incidentally to amend the interpretations followed in scholarly circles bearing on certain controversial issues concerned. Though not directly voicing the view, which ends at the root of all *śāstras*, as in the *paribhāṣā-āgamānuśāsanamanityam*, he has emphasized the basic feature of the *śāstra*, viz. that as *prayogaśāstra* it is

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[1] *Vṛ. Cand. Ud.*, f. 490*b*: (सार्द्धे सप्तदशे गते वयसि मे सत्कौस्तुभो निर्मितो विंशेऽब्दे स्तनजीवनो विरचिता प्राचीनरत्नाकरे। पश्चाद् वादकुतूहलादिकृतयस्तन्त्रान्तरेऽष्टौ कृताः पश्चात्तत्सु समाश्रयं विरचितः श्रीवृत्तचन्द्रोदयः॥ Then *Bhāṣyarāja* was written when he was 57. गुणनिधिसुनिभूमितंविक्रमवर्षे (१७९३ वि सं) ...। वेदाङ्गछन्दःसूत्रभाष्यराजोऽयमधिकाभि सम्पूर्णः॥ f. 132*a*. As. MSS. No. III, A 76 Society Collection. The *Vṛ. Cand. Ud.* was written in Śaka 1652 (fol. 490*b*), i.e. exactly seven years earlier.

[2] *Vṛ. Cand. Ud.*, f. 1b: तस्माच्छन्दो न किञ्चित्करमपि गहनं शास्त्रभारं नयामि। Verse 5c: छन्दःकौस्तुभमेव शास्त्रपदवीं यद्यप्यनैषन्तराम्।

[3] *Ibid.*, cited in the *Bhāṣyarāja*, f. 22*a*: तेन वैदिकप्रकरणोल्लङ्घनेनाप्येतादृशप्रकाराणां प्रवृत्तिः फलति। त्रियम्बकं संयमिनं ददर्शेति प्रयोगदर्शनात्।... चूर्णप्रलापे बत दग्धदेहाः सिन्नास्तेनापि भवन्ति नष्टाः। इत्याम्रेताद्यच्चरलोपस्यैवं दुर्घटवृत्तौ समाहितत्वात्। *Vṛ. Can. Ud.*, f. 74*a*: दुर्घटवृत्तौ शरदत्तेनोक्ता (?)। The first citation is not found in the present printed edition of the *Durghaṭavṛtti* (TSS.). The *Durghaṭavṛtti* notes under I. 4.20: कथं पुनः प्राप्तनाभिह्रदमिति माघे। उच्यते प्राप्तनाभिनद इति पाठः साधुः। छन्दःशास्त्रे प्रक्लेवेति सूत्रेण विकल्पेन गुरुत्वमिति कश्चित् and on V. 2॥ एवञ्च कथं परिषद्बलात् महाब्रह्मैरिति भट्टौ नवाक्षरेण छन्दोभङ्गात्। नवाक्षरैणैकपादे वृत्तभेदोऽप्यस्ति। यथा प्रधाने कर्मण्यभिहिते लादीनाहुर्द्विकर्मणाम्। तस्मै तिलोदकं दद्यादपुत्राय भीष्मवर्मणे। एवञ्च न छन्दोभङ्ग इति भाषावृत्तिः।

[4] *Bhāṣyarāja*, f. 55*b*: (पादावधूतपद्मा ... कथयन्ती पक्षपातमधिकं मयि। [the prevalent reading is अधिकं नः]). The eighth *gaṇa* at the end there consists of two short syllables instead of one long one. *Bhāṣyarāja*, f. 56*b*: उपरिधृतकरवालाकारा ... (*Bhām. vil.*, V. 113) and यदधीना सखि वृत्तिः समन्युरपि सोऽनुनेय एव। भसितशेषीकृतनगरो प्रियः कृशानुर्न कस्य वद॥ अत्रेति पदेन सार्धसप्तगान् परामृश्य ये नियमाः कतिपये विधास्यन्ते ते पथ्यायामेव ... अन्यत्र-कस्यापि नियमस्याभावे, शुद्धायैव। *Vṛ. Can. Ud.*, f. 26*b*: अस्मन्मते निराधारो हा रोदिमि कथय कस्याद्य पुरत इत्यादि प्रयोगदर्शनादुभयभागैकवर्णाया एव पदमध्ययते "नंतु प्रतिनिविष्टमूर्खजन चित्तमाराधये" दित्यादिरूपाया असाधुत्वाङ्गीकारात्।

essentially practical and cannot brush aside the authority of usage. He has advocated the authority of literary sanction as a no-way negligible determinant in the matter. Like some of the important later writers he seems to know the views[1] of Y. P., though acknowledged citations from that work[2] are rarely met with in both of his works. The advanced modern scholar has to read Bhāskararāya's works side by side, not merely with Halāyudha's *Mṛtasañjīvanī* but also with the *bhāṣya of Y. P.*, to form a just estimate of the forces at work in the way of the evolution of *Chandaḥśāstra*.

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[1] e.g. Y. P. under IV. 12: द्वयानि खलु छन्दांसि (vide footnote ?) = *Vṛ. Can. Ud.*, f. 127*b*: (वस्तुतस्तु गणघटितानुपूर्व्या वर्तेत इति वृत्तम्। तच्च जातिसाधारणम्। तासामपि मात्रागण-घटितत्वम्। वर्णगण घटितमात्रे वृत्तपदव्यवहारोऽस्तु गोबलीवर्दन्यायेन।); *Bhāṣyarāja*, f. 77*a*: (तेनेतः प्राक्तनानां लौकिकानां जातिरिति प्राचामाचार्याणां संज्ञा। आर्याऽऽदीनि समान्यादीनि वृत्त-संज्ञानि स्युः।) = Y. P. under V. । लक्षणस्य बह्वूनां गुरुलघुविन्यासप्रकाराणां सामान्येन प्रवृत्तमिति जातिच्छन्दांसीति चोच्यन्ते।... परे पुनः श्लोका वर्णविन्यासनियमेन लक्षितत्वाद्वृत्तानि। = *Vṛ. Can. Ud.*, f. 77*a*: (वर्णव्यूढो गणो द्वेधा मात्रावर्णविभेदतः। वर्णशब्दोऽत्राक्षरपरः। व्यूढ इत्यनेन गणसंज्ञा लोकसिद्धैव न पारिभाषिकीति ध्वनितम्)।

[2] The two verses of Y. P. (vide f.n. 22) are the only specimens of Bhāskararāya's acquaintance with Y. P.'s work. That this acquaintance was very likely not of the text but from hearsay evidence is inferred by his reading the first मयरस differently in the two works. The *Vṛ. Can. Ud.* has (f. 48*a*): मय . . . सम्मितं भ्रमति वाङ्मयं जगति यस्येति and the *Bhāṣyarāja* (f. 48*b*), reads: मयरसत | जभललग | सम्मितं | जगति | भ्रमति कि | ल वांङ्म। यं य | स्येत्य च and is explained thus पञ्चकलत्रयोत्तरं पादसमाप्तिदर्शनात्।

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The Kol Tribes of Central India (Monograph). *Author:* W. G. Griffith. *Price:* Rs.15.00.

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REVIEWS OF BOOKS

PRINCIPLES OF COMPOSITION IN HINDU SCULPTURE (CAVE-TEMPLE PERIOD). By Alice Boner, with a Preface by Paul Mus. Pp. xv+260, Plates XXV. Published by E. J. Brill at Leiden, 1962.

Hindu religious sculptures of the early medieval period constitute one of the most interesting and important mementos of ancient Indian culture. They were usually being studied hitherto mainly from artistic and iconographic points of view by various scholars. Very few of them, however, had any constructive suggestions to offer about the principles of composition presumably underlying the magnificent reliefs carved on the walls of the cave-temples of Mahābalipuram, Ajantā, Elurā and Elephāntā. About two decades ago, M. Hallade inaugurated such a study in her *Etudes d'Art Indien, La Composition plastique dans les bas-reliefs de l'Inde* (Paris, 1942), but her work mainly dealt with this aspect of the Gupta and post-Gupta Buddhist art, only occasionally referring to this feature of its Brahmanical counterpart. Several years after its publication, another work of a partly similar nature was published. Mlle Jeannine Auboyer studied the composition and perspective in the wall paintings of Ajantā in her *La Composition et la Perspective dans les peintures murales a'Ajantā* (Alger, 1949), where she also noted some of the points discussed by the author of the work under review. Thus, Miss Boner's conception of the *Circular Field* in these relief compositions was anticipated by Mlle Auboyer in her observation about the great use that was made by ancient and medieval artists of India of 'a circular form of grouping' in their compositions. Foucher also made remarks of a somewhat similar nature in his descriptions of the Sanchi reliefs (*The Monuments of Sanchi*, by Sir John Marshall and Alfred Foucher, Vol. I, Calcutta, 1946, p. 171), his views being further elaborated by M. Benisti in her *Le medallion lotiforme dans la sculpture indienne* (Paris, 1952).

But all these previous writers did not go to the length as well as to the depth of Miss Boner's method of studying and enunciating the compositional principles lying behind a chosen group of some of the finest specimens of Hindu sculptural art. She began her analytical study a good many years ago, but was at first somewhat diffident whether she would be able to substantiate the main conclusions she was arriving at by her keen, first-hand and penetrating observation of the reliefs on the basis of authentic and authoritative textual data. At first unable to find any such authority, she turned to the intensive study of the principles of composition present in various traditional forms of European art and became convinced that 'no great style of art, developing on natural traditional lines, had ever existed, whose forms in architecture, sculpture, painting and all minor arts had not been based on strictly mathematical and geometrical principles' (Author's Preface, xiii–xiv). But here she was unable to find any documentation for her conclusions for a long time, until she accidentally got hold of a medieval Sanskrit text written in Oriya script, *Śilpa Prakāśa* by name. This text profusely illustrated with line-drawings lays down the rules for the construction of a Devī temple, and contains beside the details about the architectural elements of the temple numerous *dhyānas* for the images to be carved on the walls accompanied by a large number of diagrams and the exact rules for their composition. The diagrams, though mainly

applicable to later types of temple-reliefs, appear to have some points of similarity with those geometrical drawings she had made on the basis of her deep study of the earlier rock-cut sculptures. This remarkable coincidence justified her basic assumption that 'laws of composition, although not explicitly mentioned in other Śilpaśāstras, had never been limited to architectural elements, but had always included sculpture as well' (*ibid.*, p. xiv). A point worth noting in this connection is that it is a work presumably based on the experiences of generations of Orissan artists, which has supplied our author with the long-looked-after documentation for her researches, just as other Śilpa texts of Orissa had helped previous scholars in their study of temple architecture, especially in its terminological and other aspects.

In the introduction of fifty pages of the monograph the author has given her readers a general idea about the modes and methods of her research, after a reference to the main trends in the study of Hindu art by many of the previous scholars. In her case, she perceived a coherent system of composition in the magnificent rock-cut reliefs, and attempted to reduce it in terms of geometrical patterns. We may refer after Paul Mus to the three principal ideas underlying Miss Boner's penetrating study of them. Firstly, the substratum of the composite reliefs is a *circular field* around a central point (*vindu*), divided by six, eight or twelve diameters and further subdivided by a number of chords running parallel to the diameters. Secondly, the points where the diameters intersect the circle are connected by vertical and horizontal chords. This network has been visualized by her as indicating the *Space-division* or *Measure* of the relief. Thirdly, the same points of the circle are further connected by chords running parallel to the oblique diameters; the lines of this network determine all stresses and movements within the composition and, with the movements, create the *Time Sequence* (*Division*). This way of looking at the inner form and character of the composite reliefs is the focal point of her research, and the synthesis of both the *Space* and *Time-divisions* of each group and the meaning resulting from this synthesis are described by her as *Integration* and *Interpretation* of each.

In the body of her monograph (pp. 53–240) she takes up several groups of Vaiṣṇava (Part One) and Śaiva (Part Two) reliefs from the rock-cut shrines of Elurā, Mahābalipuram and Bādāmi (she could not utilize any of the Elephāntā sculptures, on account of their sadly-mutilated state) and projects her mode and method in studying and interpreting them individually. The first group consists of as many as fourteen reliefs beginning with the famous Narasiṁha Avatāra from Elurā, Cave XV, and ending with the Mahābalipuram figure of Viṣṇu on Ādiśeṣa; the same theme illustrated in Elurā, Cave XV, has also been discussed in the immediately preceding pages. In between, two Mahālakṣmī reliefs, one from Elurā, Cave XIV, and the other from Mahābalipuram, one Viṣṇu Trivikrama, each from Elurā, Cave XV, Bādāmi, Cave II, and Mahābalipuram, and five Varāha Avatāras, one each from Elurā, Caves XIV and XV, Bādāmi, Caves II and III, and from Mahābalipuram, have been studied in detail. In the second part three figures of Dancing Śiva (Naṭarāja) from Elurā, Caves XIV and XV, and from Bādāmi, and two figures of Jñānadakṣiṇamūrti and Gajāsurasaṁhāramūrti of Śiva from Kailāsanāthasvāmin temple, Elurā, and a relief depicting the Andhakāsuravadham in Cave XV of Elurā, and lastly the Mahiṣāsuramardinī relief from Mahābalipuram, seven bas-reliefs in all, have been discussed at great length. The description of each sculpture is accompanied by a plate, the first of the three (in one case four) sections of which show its half-tone reproduction, and the next two the

Space and *Time-divisions* as understood by her, with the help of geometrical patterns drawn over the black-and-white outline of the relief. In this way she has taken great pains to help her readers to follow the subtle nuances of her abstract reasoning. The subject is not an easy one, and a very close and deep observation alone of the bas-reliefs in question, in the light of her deductions, will enable the serious students of Hindu sculptural art to grasp their structure. It may be remarked that the acceptance of the subjective and invisible background behind the individual reliefs will explain their remarkably dynamic and at the same time orderly exposition of the theme being illustrated by them. The creators of the magnificent sculptural art appear to have skilfully planned out the scheme of the relief composition before they began to ply their chisel on the native rock trap.

A few more relevant observations need be made here. In page 9 of her work the author says: 'It was a custom in India to use the arm or hand of the chief architect or of the patron of the building as a unit of measurement.' But it was the *aṅgula*, the width of the middle digit of the medius of either, which was sometimes regarded by the *Sthapatis* as the working unit. This unit appears to have been determined at other times indirectly, when it was described as *dehalabdha aṅgula*; but this sort of relative unit was mostly used in image-making. The total width of twelve *aṅgulas* would make up a *tāla* approximately equivalent to the length of the face, or that of the outstretched palm. Her remark on page 17 that 'the primary purpose of sacred images is not to give aesthetic enjoyment, but to serve as focusing points for the spirit' is very appropriate; a similar remark was made by the present reviewer about twenty years ago in his chapter on iconography in the *Dacca History of Bengal* (Vol. I, p. 474). Her attempt to equate the different positions of the central point (*vindu*) in the sculptural composition with that of one or the other of the five elemental *cakras* of the human body (*Mūlādhāra*, *Svādhiṣṭhāna*, *Maṇipūra*, *Anāhata* and *Viśuddha*) is very suggestive. Her remark that the concentrically organized diagrams underlying the sculptures may also represent cosmic symbols, as the *yantras* or *maṇḍalas* are supposed to do (p. 29) is worth considering. She has rightly criticized the widespread notion in modern times that 'principles of composition or any system and law binding an artist would have a deadening effect on his work' (p. 34); a more or less similar view was also expressed by the present reviewer in his *Development of Hindu Iconography* (2nd edition, pp. 239–43).

It would not be possible to cite other thought-provoking suggestions, abounding in Miss Boner's work in the space of this review. Her long stay in India and close contact with Hindu religious thought and literature has enabled her to handle the difficult subject with a great deal of competence. She deserves congratulations for developing the new line of approach in the study of some of the finest rock-cut relief compositions of early medieval India. The publishers are also to be congratulated for the get-up and format of the monograph in which printing errors are very few and far between.

J. N. BANERJEA

THE GALLONGS. By L. R. N. Srivastava. 1962. Pages 128. Price Rs.6.50 nP.

THE AKAS. By Raghuvir Sinha. 1962. Pages 143. Price Rs.6.50 nP. Research Department, Adviser's Secretariat, Shillong.

Both the books provide some but not full ethnographic accounts of the two little-known tribes of N.E.F.A. If comparison is made between

these two with the previously published monographs of Assam tribes written by the civilians in charge of administration, the former scores very poor marks. Barring all the qualities of a good book for which there is a demand, one will have to wonder at the poverty of the materials in these two. Whether one resorts to theory or generalization or not, one expects detailed accounts which will form the basic materials and which will be of immense value to all—scientists or administrators. It is no use, therefore, to delineate what the authors have not done. Reading of the books will surely convince anybody that there are some materials on social facts which are very important but they have not been treated and discussed at length.

Among the Gallongs taboo on the woman to use the ladder meant for men to go in or come out of the house is one such and the use of folding ladder by the bride among the Karko Gallong is the other. Apart from belief and superstition, these two phenomena may be correlated to the social and economic structures. Bundles of confusions as to the form of family may crop up from the loose statements (pp. 59–60) below : 'the combined monogamous and polyandrous family is the basic unit'; a few combined polyandrous and polygynous families can also be seen; and that in a family which is basically polyandrous . . . The correlation between the absence of dormitory and the uniclan village system and polyandry is a good attempt but details are lacking in respect of the practice of polyandry.

With regard to the second book, *The Akas*, important and interesting features are the rigidity of food taboo on women alone, co-existence of clan and village exogamy, status and roles of Rani, Nichulere-Nuggo and Gaon Burah of a village in the socio-political structure and, lastly, the inter-marriage relations with the Mijis. The author does not give us anything more than mythological, geographical and economical factors as to the cause of inter-marriage with the Mijis.

The authors had all the advantages of staying in the tribal areas for three years and of knowing them fully.

B. K. CHATTERJEE

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[*Continued from Jl. As. Soc., Vol. IV, No. 2, 1962. Supplement, page 152*]

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